

# **ENVIRONMENTAL MANAGEMENT SYSTEM**

# 2006

## **MANCHESTER ENVIRONMENTAL LABORATORY**

**EPA Region 10  
7411 Beach Drive East, Port Orchard, Washington 98366**

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## Acronyms Used in This Manual

CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response, Clean-Up and Liability Act
CFC	Chlorofluorocarbons
CFR	Code of Federal Regulations
CHO	Chemical Hygiene Officer
CHP	Chemical Hygiene Plan
CPG	Comprehensive Procurement Guidelines
DBA	Decibels
DCM	Dichloromethane
DI	De-ionized (water)
EHS	Environmentally Hazardous Substance
EMS	Environmental Management System
EMP	Environment Management Program
EPCRA	Emergency Planning and Community Right to Know Act
ESAT	Environmental Services Assistance Team
FAR	Federal Acquisition Regulations
FMSB	Facilities Management Services Branch
FTE	Full-Time Equivalent
GPC	Gel Permeation Chromatography
HVAC	Heating and Air Conditioning
HQ	Headquarters
ISO	International Organization for Standardization
LEPC	Local Emergency Planning Committees
MEL	Manchester Environmental Laboratory
MSDS	Material Safety Data Sheets
NMFS	National Marine Fisheries Service
NRC	Nuclear Regulatory Commission
O&M	Operation and Maintenance
OARM	Office of Administration and Resource Management
OC	Operational Control
PBT	Persistent/Bioaccumulative/Toxic (chemical)
PFE	Pressurized Fluid Extraction
PM	Preventative Maintenance
QA	Quality Assurance
RCRA	Resource Conservation and Recovery Act
RSO	Radiation Safety Officer
SERC	State Emergency Planning Commission

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SOP	Standard Operating Procedure
SOW	Scope of Work
SHEMP	Safety, Health and Environmental Management Program
TBD	To Be Determined
TRI	Toxic Release Inventory
TSCA	Toxic Substance Control Act
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compounds
WAC	Washington Administrative Code
WDO	Waste Disposal Officer
WDOE	Washington State Department of Ecology
XRD	X-Ray Diffraction

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## **Section 1 - Introduction to the EMS Manual**

### **1. Purpose of EMS Manual**

This Environmental Management System Manual serves as a repository for documentation related to the Environmental Management System (EMS) including:

*procedures* that describe how to carry out key tasks within the EMS such as training, identifying environmental aspects, or managing records,

*programs and controls* that operate under the EMS, such as programs for achieving EMS objectives and targets and carrying out audits,

*records* or directions that enable individuals to locate appropriate records that confirm the completion of specific EMS activities such as the identification of environmental aspects, EMS training that has been given to specific employees, or the completion of management reviews,

*definitions, references, and appendices* that contain additional information useful to individuals reviewing the EMS.

In addition to the chart created for significant environmental aspects, the EMS Manual holds documentation of the environmental management programs, the operational controls, the EMS audit programs and procedures, all other EMS procedures, EMS records and other descriptive information useful to anyone being introduced to the EMS or to those responsible for the EMS.

### **2. EMS Manual Maintenance**

This EMS Manual is maintained by Stephanie Bailey, United States Environmental Protection Agency (USEPA) Region 10 Laboratory Microbiologist and EMS Coordinator.

The official version of this EMS Manual is located on the USEPA Region 10 Laboratory internet website.

This EMS Manual was last updated on January 23, 2006.

### **3. EMS Implementation at Manchester Environmental Laboratory**

#### **3.1 EMS Design**

The design of this EMS at the Manchester Environmental Laboratory (MEL) was initiated in response to Executive Order 13148, which mandates that all federal facilities have an environmental management system in place by the end of 2005. The design of MEL's EMS was begun in December 2001 with the appointment of the EMS Coordinator by the USEPA Region 10 Laboratory Director. The EMS Coordinator formed an EMS Design and Implementation Team (EMS Team) composed of USEPA Region 10 Laboratory employees,

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Washington State Department of Ecology (WDOE) Laboratory employees, and Techlaw Environmental Services Assistance Team (ESAT) employees. With feedback from all MEL employees, the EMS Team and MEL's top managers wrote the environmental policy statement. The EMS Team then spent more than a year identifying MEL activities, their environmental aspects and impacts, assigning significance to the aspects, creating environmental management programs for the significant aspects, setting objectives and targets for the programs, identifying operational controls for the targets, and finally, describing in writing the procedures used to perform all these tasks and additional tasks necessary for an effective EMS.

### **3.2 EMS Initiation of Implementation**

In February 2004, MEL held an all-staff EMS awareness training session followed by small workgroup awareness training sessions in March 2004 to initiate implementation of the EMS. In August 2004, the USEPA Safety, Health and Environmental Management Division (SHEMD) provided contractor support for an EMS Team training session and a Management Review training session. The final elements of the EMS - the audit program and management review program - were then written and the EMS Team held its first EMP status meeting. In September 2004, the EMS Team held its second EMP status meeting. In October 2004, the EMS contractor returned to perform an all-staff awareness training session, immediately followed by an assessment of the system that closely modeled the expected format and content of the pending USEPA SHEMD external EMS review. Corrective actions for deficiencies identified by the assessment were documented and implemented. In November 2004, a management review of the system was performed and adjustments made to the system.

### **3.3 EMS Completion of Implementation**

Implementation of the EMS was completed in January 2005 after the USEPA SHEMD external EMS review was performed and corrective actions as a result of the review were closed out. The EMS self-declaration process consists of the USEPA Region 10 Administrator submission of a letter to the USEPA Environmental Executive (Assistant Administrator, OARM) stating that MEL has completed the twelve steps of the EMS Implementation Process and has a fully functioning EMS in place.

## **4. Background to Environmental Management Systems**

Formal Environmental Management Systems emerged in the early 1990s to provide organizations with a proactive, systematic approach for managing the potential environmental consequences of their operations. Such systems have been widely adopted by industry and government and have been effective at improving regulatory compliance and environmental performance.

In April 2000, President William Clinton signed Executive Order 13148, "Greening the Government through Leadership in Environmental Management" that established a five year EMS implementation goal for all federal facilities. President George W. Bush supported this position. The USEPA, as the principle steward for the environment, has taken a leadership

position by developing an EMS implementation initiative.

#### **4.1 EMS Description**

Although several recognized EMS frameworks exist, most are based on the International Organization for Standardization's ISO-14001 EMS standard. As a result, ISO-14001 is the framework on which the USEPA has chosen to base its EMS. The EMS phases under ISO-14001 include:

##### **4.1.1 Phase 1: Planning**

The organization identifies how its operations might harm the environment, and develops methods to reduce this harm.

##### **4.1.2 Phase 2: Doing**

The organization implements these methods to reduce harm and operates them for a designated time period.

##### **4.1.3 Phase 3: Checking**

The organization assesses whether the programs that it is operating to reduce environmental harm and ensure regulatory compliance are proving to be effective.

##### **4.1.4 Phase 4: Acting**

The organization determines what changes are necessary based on the performance of the programs designed to reduce environmental harm.

The findings may indicate that adjustments to programs already in place are necessary or that entirely new programs are needed to achieve established environmental objectives. Output from this phase is fed back into Phase 1 to make necessary changes and additions designed to bring the EMS to the desired level of effectiveness. This system feedback propels the continual improvement of the EMS.

The EMS continually moves through this cycle, fine-tuning its management of those areas of the organization's operations that harm the environment. This "continual improvement cycle" is a core tenet of the EMS and drives the system to adapt to the dynamic nature of the organization's operations.

#### **5. Structure and Key Elements of the EMS**

##### **5.1 EMS Scope**

In order to be able to set achievable objectives and targets, an organization must define the

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boundaries within which it intends to assume environmental responsibility. MEL has defined the physical boundaries of its EMS as the fence lines to the west and north of the facility, the shoreline to the east of the facility, and the edge of the National Marine Fisheries Service (NMFS) property to the south. While non-physical boundaries are more difficult to describe, MEL is committed to assuming environmental responsibility for the actions of all employees physically working at the facility, regardless of whether they are full-time, part-time, permanent, temporary, contractors or subcontractors. While MEL does not assume environmental responsibility for the actions of its suppliers or customers, it does recognize that at times it may choose to act more globally by influencing or assisting them to assume more environmental responsibility.

## **5.2 Environmental Policy**

The Environmental Policy verbalizes the organization's commitment to environmental responsibility. It describes the degree of commitment by top management and serves as the guide for behavior and actions of all members of the organization to achieve a high level of environmental protection.

## **5.3 Planning**

EMS planning activities determine the environmental aspects and impacts of the work conducted at MEL. Environmental management programs (EMPs) are designed to control and, where possible, reduce the impacts associated with the identified aspects.

### **5.3.1 Environmental Aspects**

Actual and potential interactions with the environment are an organization's environmental aspects. These interactions are identified by reviewing all the activities, products, and services of the organization and assessing the possibility of each of them to have an environmental impact. It is important to recognize that these impacts may be positive or negative and that the organization should set objectives to increase positive impacts and reduce negative impacts. The organization can then develop programs to manage the environmental aspects they believe are significant either to the environment or to the organization.

### **5.3.2 Legal and Other Requirements**

An EMS recognizes that certain environmental aspects are significant for an organization because they impinge upon certain legal or other requirements, which can affect the organization's ability to carry out its mission. These may include federal, state, and county requirements, industry standards or organizational standards. The organization must establish a procedure to identify these requirements. It is prudent for all environmental aspects with legal implications to be designated as significant.

### **5.3.3 Executive Orders and Other Policies**



While not mandated by law, Executive Orders are policies with which federal facilities are expected to comply. Executive Orders are generally written directing a whole federal agency, rather than each individual federal facility, to achieve a measurable goal. This makes it possible for individual federal facilities to vary their level of compliance with the Order while the agency as a whole achieves the Order.

MEL is committed to doing as much as is reasonably possible, while still accomplishing our mission, to assist the United States Environmental Protection Agency in achieving the goals set forth in Executive Orders.

#### **5.3.4 Objectives and Targets**

Generally, objectives and targets are established to address each of the organization's significant environmental aspects and are integrated at all levels and functions of the entity. Objectives and targets are set by considering legal requirements, views of interested parties, and technological, financial, and operational considerations. This insures that objectives and targets are robust, that they respond to legitimate concerns, that they are realistic for the organization, and that it is possible to develop strong management programs to achieve them.

#### **5.3.5 Environmental Management Programs (EMPs)**

Environmental management programs serve to achieve the organization's objectives and targets and are therefore linked directly to them. EMPs contain details on the resources (e.g., financial, human, and technological) and timeframes to accomplish the objectives and targets. They also contain information describing the approaches and strategies for achieving objectives and targets as well as the performance indicators, the operational controls, the roles and responsibilities to accomplish tasks, and the competency of individuals to accomplish those tasks. The EMP ties many elements of the EMS together (e.g., significant aspects, objectives and targets, resources, responsibilities, and capabilities) and provides an integrated view of the disparate requirements in the EMS.

### **5.4 Implementation and Operation**

#### **5.4.1 Roles, Authorities and Responsibilities**

Roles and responsibilities for activities under the EMS must be clearly defined and, as stated above, many of these appear in the EMPs. While an EMS is largely sustained by the voluntary participation and commitment of members of the organization, certain duties are assigned with clear roles and responsibilities and with attendant accountability for performance and results. For example, top management must appoint a management representative to be responsible for leading the creation, implementation, and maintenance of the EMS. Other roles are assigned to members at various levels and functions throughout the organization where significant environmental aspects are present.

#### **5.4.2 Training, Awareness, and Competence**

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An EMS requires two types of training: general awareness and competence training. General awareness training for all employees focuses on the importance of the environmental policy, the role of employees, and the potential consequences of failing to provide environmental care. Competence training is prescribed for members that work in proximity to significant environmental aspects and focuses on the possible significant impacts of those aspects, their specific roles and responsibilities, the objectives and targets for those aspects, and the operational controls (OCs) in place to avert the actualization of the potential impacts. The EMS Coordinator ensures that both types of training are conducted as appropriate to satisfy these requirements. Competence training is detailed in the EMPs and in the documentation of operational controls. Because of their size, competence requirements may be physically separated from the EMPs or OCs but must be referenced in such instances in the EMP or OC.

### **5.4.3 Communication**

Effective, integrated environmental management requires effective communications to coordinate staff internally and to interact with external stakeholders. Maintaining employee awareness of EMS initiatives, motivating them, and supplying them with knowledge of their roles and responsibilities all require communication and communication is a two-way process. In an effective EMS, employees make recommendations to management and give their views when necessary.

Views of interested parties should be considered in the EMS. This means that there must be effective two-way communication between external stakeholders and the facility. Interested parties should be able to communicate their views to the facility and the facility should respond to these parties.

### **5.4.4 EMS Documentation**

It is important that the organization maintain information that would allow someone with a legitimate interest in the EMS to understand how it is designed and implemented. This information is essential for employees who need to know about an EMS issue, as well as for external parties such as customers, regulators, registrars and other interested parties. In many cases, the EMS Manual will fulfill this documentation requirement. However, it is likely that some documents will be maintained outside the EMS Manual, in which case they must be referenced in the Manual.

### **5.4.5 Document Control**

Due to the wide variety of documents used in the EMS, it is essential that a formal approach be developed to control and organize them. This document control procedure must ensure that all documents in use are the current versions. This includes removing obsolete documents from circulation.

### **5.4.6 Operational Control**

It is important to control those activities, products or services that might cause a deviation from the organization's environmental policy or result in significant impacts. These controls are designed to support the achievement of EMS objectives and targets. An operational control is a specified engineering or administrative measure implemented to reduce the risk that an impact will occur. Operational controls are included as integral components of the EMPs. Because of their size, they may be physically separated from the EMP but must be referenced in such instances in the EMP.

#### **5.4.7 Emergency Preparedness and Response**

The EMS provides a systematic method to manage known and expected elements of the organization's operations. However, despite best efforts, there is the possibility of unpredictable accidents and emergencies. Those that are predictable should be addressed in the EMS through the EMPs and the operational controls. The organization's emergency preparedness and response plan provides for the unexpected. From the perspective of the EMS, measures must be included in this plan to address the environmental consequences of such occurrences. It is expected that such measures work to control and mitigate those possible environmental consequences.

### **5.5 Checking and Corrective Action**

#### **5.5.1 Monitoring and Measurement**

Monitoring and measurement is fundamental to the EMS. It ensures that management plans, operational controls, and training are effective. Furthermore, it enables the organization to track its progress toward achieving objectives and targets and to identify the reasons for its level of achievement. In addition, one of the basic tenants of an EMS is continual improvement. Without effective monitoring and measurement, it is unlikely the system will continually improve. An effective EMS requires that the organization periodically monitor performance, operational controls, and general conformance with EMS objectives and targets.

#### **5.5.2 Nonconformance and Corrective and Preventive Action**

When an organization identifies a weakness or ineffective part in the EMS, it needs to implement a correction. The EMS requires a procedure to identify, document, and investigate problems; understand their root causes; and implement corrective actions that prevent recurrence.

#### **5.5.3 Records**

While it is critical to effectively implement all the various elements of the EMS, it is also important to be able to demonstrate that you have done so. This is done through the creation and management of records of various implementation activities, training, audits, and management reviews. These records must be managed so that they can be easily accessed and retrieved. Additionally, they must be assigned retention dates that specify how long they need to be kept by

the organization. One way to do this is to mark each record with a creation date and then state in the EMS procedure the minimum length of time all records must be kept for use by the EMS.

#### **5.5.4 EMS Internal Audits**

An EMS audit tests whether the system has been implemented and maintained as designed. It must be understood that an EMS audit is not a compliance audit. The reason compliance data is scrutinized during an EMS audit is to test whether the programs (EMPs) that have been implemented are actually working as intended to achieve and maintain regulatory compliance within the EMS. Conversely, an organization may use the EMS internal audits to gauge their status on regulatory compliance.

#### **5.6 Management Review**

The EMS reserves a special role for top management. Not only must they formulate and articulate the environmental commitments of the organization in the environmental policy, they must also render judgment on whether the EMS continues to be suitable, adequate, and effective. This is accomplished formally through periodic management reviews where they have the opportunity to judge the EMS and its results and make decisions relative to the EMS so that it continues to perform and deliver as desired.

## **Section 2 - Organization Scope and Characteristics**

### **2.1 Organizational Mission**

The USEPA Region 10 Laboratory applies science policies, principles and methods to support regulatory programs, monitoring programs and special projects. Laboratory expertise is directed at a daunting array of environmental issues through direct implementation and leveraged through partnerships with state, local, and tribal governments, private industry, the academic community, EPA program offices, EPA's Office of Research and Development, and the public. The Region 10 Laboratory is crucial to advancing the Agency's science agenda through the application of the following principles:

Integrate laboratory activities with those of field and quality assurance partners into a comprehensive, holistic, multi-media approach to solving ecosystem-based environmental problems.

Provide scientific data of known quality to support Agency decisions through partnerships with regional and national media program offices, state, local and tribal governments, academia, the private sector and the public.

Maintain a fully equipped laboratory to produce physical, chemical and biological data of known quality to be used for environmental decision-making at all levels of government.

Maintain and enhance a technically and scientifically skilled, dedicated and diverse staff

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through outstanding recruitment, career development, training, management and leadership.

The Washington State Department of Ecology Laboratory, Techlaw (the Environmental Services Assistance Team contractor), and ICF Kaiser (Techlaw's subcontractor) all share the laboratory buildings and facilities with the USEPA Region 10 Laboratory. This EMS applies to all operations and employees working at the facility. The name "Manchester Environmental Laboratory" ("MEL") is used when referring to the combined operations of all entities at the laboratory.

## 2.2 Facility Description

Total number of employees: (variable, number as of 11/23/2005)	23 USEPA 13 ESAT 26 WDOE 4 Maintenance Contractors 6 Janitorial Contractors
Total number of buildings:	10
Area of buildings:	65,000 square feet
Property area:	17 acres
Site boundaries:	Manchester State Park, Clam Bay, Navy Fuel Depot, NMFS Laboratory
Activities that occur outside the site boundaries:	NMFS Laboratory, commercial fish-farming, Manchester State Park
Approximate number of employees whose activities may involve significant aspects:	72
Size of EMS Team:	12
Composition of EMS Team:	Chemists, Microbiologist/Recycling Coordinator, Lab Technician/ Criminal Sample Custodian, Facility Manager, Office Manager, Safety and Health Officer, Data Management Specialist/Waste Disposal Officer, Purchasing Officer.

## 2.3 Environmental Hazards

Numerous activities at MEL have a potential environmental risk. The Laboratory uses toxic chemicals and produces hazardous wastes during the process of analyzing environmental samples. A work force of approximately 72 employees uses a significant amount of paper and produces substantial amounts of solid and liquid waste. The 65,000 square foot facility requires a significant amount of electricity, water, and fuel to heat, light, and operate.

### **Section 3 - Environmental Policy**

The environmental policy statement is a declaration of top management's commitment to the environment, and serves as the foundation for the EMS. Everyone in the organization is expected to be familiar with and understand the policy. The policy is considered when setting EMS objectives and targets, and it is understood that the implementation of the EMS serves to actualize the commitments in the policy. The environmental policy statement is, therefore, a vehicle for communicating the organization's aspirations for environmental protection as well as a functional tool for establishing the operational boundaries of the EMS. The environmental policy aligns with the organization's core mission and must include commitments to continual improvement, pollution prevention, and regulatory compliance. The environmental policy statement should reflect management consensus on its contents and aims and should be formalized through the signature of top management.



## Manchester Environmental Laboratory Environmental Policy Statement



The Manchester Environmental Laboratory is home to the USEPA Region 10 Laboratory, the State of Washington Department of Ecology Laboratory and the USEPA Region 10 Environmental Services Assistance Team, along with associated support staff.

The goal of the employees of the Manchester Environmental Laboratory is to make our air cleaner, our water purer, and our land better protected from contamination and the impacts of human development. The employees of the Manchester Environmental Laboratory work toward this goal by applying science in support of our media programs. To accomplish this task, we maintain a fully equipped laboratory to produce physical, chemical and biological data for environmental decision-making. Since laboratories themselves can be substantial sources of pollution and hazardous waste production, the employees of this laboratory commit to the following environmental management policy:

### Compliance with Relevant Laws:

We will comply fully with the letter and the spirit of all applicable federal, state and local environmental legislation and regulatory requirements. Where existing laws and regulations are not adequate to assure protection of human health, safety and the environment, we will establish and meet our own health, safety and environmental standards. To sustain this commitment, the requirements of our Environmental Management System will apply to all activities and employees and we will implement programs and procedures to assure compliance. We will provide appropriate environmental training and educate employees to be environmentally responsible on the job and at home.

### Pollution Prevention:

We will minimize risk and protect our employees and the community in which we operate by employing safe technologies and operating procedures in both routine and emergency conditions. We will minimize the amount and toxicity of waste generated and will ensure the safe treatment and disposal of waste. We will seek to use energy more efficiently throughout our operations. We will consider environmental factors and full acquisition, use and disposal costs when making planning, purchasing and operating decisions.

### Communication:

We will communicate and reinforce our commitment to health, safety and environmental quality to our employees, vendors, customers, other government entities and the community in which we operate. We will solicit their input in meeting our goals and will offer them assistance in meeting their goals. We will work cooperatively with others to further common environmental objectives.

### Continual Improvement:

We will seek opportunities to improve our adherence to these principles of environmental management and will periodically report our progress to the public. Above all, Manchester Laboratory employees will strive to continuously improve our efforts to create a cleaner and safer environment.

\_\_see signed original\_\_\_\_  
Linda Anderson-Carnahan  
USEPA R10 Lab Director

\_\_11/23/04\_\_  
Date

\_\_see signed original\_\_\_\_  
Stuart Magoon  
WDOE Lab Director

\_\_11/23/04\_\_  
Date

\_\_see signed original\_\_\_\_  
David Dobb  
Techlaw ESAT Team Leader

\_\_11/23/04\_\_  
Date



## **Section 4 - EMS Procedures**

Section 4 contains all the organization's EMS procedures. Each procedure describes the methodology used by MEL to execute the various elements of an integrated EMS. The purpose of these procedures is to enable individuals within MEL to understand the requirements of the EMS and to ensure reliable and consistent execution of those requirements for an effective system. Section 4 contains the authorized verbatim version of these procedures. Copies may be distributed to each relevant function and level in the organization so that they are available to those individuals that need to reference them.

### **EMS Procedures**

1. Audits and Compliance Status
2. Calibrating Instruments
3. Document Control
4. Emergency Preparedness and Response
5. Environmental Management Programs
6. External Communications of Significant Environmental Aspects
7. External Interested Parties
8. Internal Communications
9. Legal and Other Requirements
10. Management Review
11. Non-Conformances, Corrective and Preventive Action
12. Objectives and Targets
13. Operational Controls
14. Records Management
15. Suppliers and Contractors
16. Significant Environment Aspects
17. Tracking Performance
18. Training Employees

## **Internal EMS Audit and Compliance Status Procedure**

### **Purpose**

This procedure specifies the requirements for performing internal EMS Audits at MEL. These audits are a part of MEL's EMS and are conducted periodically to ascertain whether the EMS is being properly implemented and whether it continues to conform to MEL's environmental management policy. ISO14001 will be used as guidance in conducting the internal EMS audit. These audits also assess the regulatory status of MEL.

### **Scope**

During each calendar year, an internal EMS audit will cover the arrangements and expectations that have been built into MEL's EMS. All parts of the organization covered by the EMS are legitimate areas for internal EMS audits.

**Definitions** (see EMS Non-conformance, Corrective and Preventative Action procedure for definitions of noncompliance and nonconformance)

**Internal EMS audit:** A periodic audit of the EMS to verify that it is properly implemented and that it continues to conform to planned arrangements for environmental management. It is an audit of the system and findings are expressed as non-conformance. Audit conclusions are based on the findings and focus on the root causes that led to non-conformance with the EMS. It is appropriate to seek the root causes of known non-compliance findings during an EMS audit, since these may reflect EMS deficiencies.

**Compliance audit:** A periodic audit of compliance with regulatory and other requirements that are imposed on the organization. Findings are expressed as non-compliance. The search for root causes in a typical compliance audit is not as intensive as it should be during an EMS audit.

### **Approach**

#### **1. Frequency of Audits:**

Internal audits shall be scheduled on the basis of need, as reflected by the importance of activities or the results of previous audits, but not less than annually in order to verify that the system is implemented and functioning as expected. An individual audit may be limited to a sampling of EMS elements or areas in MEL, and can be both random and/or focused on certain activities based on their importance and/or results of previous audits.

#### **2. Responsibilities:**

The EMS Coordinator is responsible for creating and managing the Audit Program. The audit team shall consist of employees that are deemed competent to conduct such audits. At least one member of the audit team must not work within MEL. An employee that has

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received EMS audit training shall also be present. The lead auditor ensures that the audit team conducts and completes the audit as planned.

### 3. Audit Planning:

Each audit requires an audit plan that is prepared by the lead auditor for that audit. The audit plan addresses the following preparatory matters:

- Audit scope and objectives.
- Audit criteria to be applied.
- Contacts and coordination with the individuals responsible for the areas to be audited.
- Audit dates, times and other logistics.
- Review of previous audits, records, profiles and descriptions.
- Protocol for conducting the audit (e.g., interviews, access, coordination, safety, resolution of findings).
- Responsibilities for writing the audit report and for follow-up actions.

### 4. Requirements:

- EMS audits will be conducted against pre-established audit criteria. The criteria for the audit shall be based upon the specified arrangements for the EMS and shall be designed to elicit evidence of conformity with ISO-14001 and MEL's EMS.
- The audit criteria shall be developed by the EMS Coordinator or jointly with the lead auditor.
- The focus of the EMS audit is to ascertain whether the EMS has been effectively implemented and is functioning in accordance with established arrangements. The audit shall consist of questions and tests.
- Audit findings must be based on objective evidence that is properly corroborated and authenticated. (Auditors should avoid reaching conclusions on the basis of hearsay or opinion.)

### 5. On-site Audit Process:

- EMS audits will be conducted primarily through interviews with personnel.
- EMS audits may involve sampling. For example, compliance data may be sampled to ascertain whether EMPs are achieving their intended objectives.
- The EMS auditors may also rely on records for information related to the functioning of the EMS and attainment of its objectives and targets.
- The EMS auditors may also rely on observations of operating conditions to gauge environmental status and conditions if that is appropriate and efficacious.
- The audit team will document corrective actions. Responsibility for corrective actions will reside with management in the area where the findings occurred. If a corrective action relates to the EMS itself, the

Environmental Coordinator will have primary responsibility for making the correction. The Laboratory Director and the audit team ensure that corrective and preventive actions are completed. The process for corrective and preventive actions is the same for findings during the EMS audit as it is for findings that may be detected from time to time in the EMS through other means.

6. Compliance Status:

The status of regulatory compliance may be based on the results of a recent compliance audit, or it may be based on the data generated in the EMS to track the achievement of objectives and targets, including regulatory requirements. The EMS Team will discuss compliance issues during the monthly EMS Team meetings and the minutes will document the communication of compliance status.

7. Audit Report:

The lead auditor will complete the audit report and make it available to the Laboratory Director and the EMS Coordinator. The lead auditor will also prepare the Corrective Action Request (CAR). After conferring with the EMS Coordinator, the responsible staff will address findings by developing corrective and preventive actions.

8. Closing the Audit:

The EMS audit is closed when the lead auditor establishes that the corrective and preventive action plans have been developed and are likely to be effective.

9. Inputs to Management Review:

The internal EMS audit report and actions taken to address findings will be used during the Management Reviews.

## **Records**

Records generated by this procedure include:

1. The audit plan.
2. The audit criteria.
3. Communications between the audit team and the individuals responsible for the area being audited.
4. The audit report including findings and conclusions.
5. Documentation of the completion and effectiveness of corrective and preventive actions.

6. Statement on compliance status (typically recorded by writing the status statement into the minutes of the EMS Team meetings).

## **Calibrating Instruments Procedure**

### **Purpose**

The purpose of this procedure is to specify responsibilities and give guidance on the calibration of monitoring and measuring instruments used to measure the performance of MEL's EMS.

### **Scope**

This procedure applies to all instruments that require periodic calibration and are used to monitor or measure indicators of environmental performance under MEL's EMS. Note: the requirements of this procedure do not necessarily apply to other instruments used by MEL.

### **Definition**

Calibrate: To check, adjust, or systematically standardize the graduations of a quantitative measuring instrument.

### **Approach**

1. Take an inventory of all instruments used to monitor and measure indicators of performance for the EMS and identify those which require periodic calibration.
2. Assign responsibilities for calibration to every instrument requiring calibration. The person responsible for calibration of an instrument is not necessarily the same person that operates or reads that instrument.
3. Ensure that the person responsible for calibration has been given the training, tools and instructions needed for proper calibration. Instructions should include the frequency and method of calibration.
4. State in the appropriate Operational Control the title and task of each person with calibration responsibilities.

### **Records**

The following records pertaining to calibration are kept at MEL:

1. The instruments used for monitoring and measurement of EMS performance indicators that require periodic calibration are listed in the appropriate Operational Control.

2. The Operational Control Records also indicate how often the calibration is required and who is responsible for performing the calibration and for keeping the records of calibrating each instrument that requires periodic calibration.
3. Records of calibration instructions.
4. Records of actual calibrations including names and dates on which calibrations were performed.

## **Document Control Procedure**

### **Purpose**

The purpose of this procedure is to ensure that only the current, authorized versions of EMS documents are in use by site personnel when executing their EMS tasks.

### **Scope**

This procedure applies to all documents in use for the EMS.

### **Definition**

Document control: This term is synonymous with document management but highlights the importance of removing outdated versions from use and circulation and ensuring operators are only using the latest authorized version of all EMS documents.

### **Approach**

1. The current, implemented version of all EMS documents will be posted on the USEPA Region 10 Laboratory internet site.
2. All current, implemented EMS documents shall be dated to aid in ensuring the correct version is used.
3. When a document is updated and implemented, employees shall be notified that a new document has been issued.
4. An electronic or paper copy of outdated documents shall be filed in the custody of the EMS Coordinator for five years or as otherwise required by law.

### **Records**

Records generated by this procedure include:

1. An electronic or paper copy of each outdated document.
2. Communications to staff notifying them of new implemented versions of EMS documents.



## **Emergency Preparedness and Response Procedure**

### **Purpose**

The purpose of this procedure is to highlight the EMS requirements for preparing and responding to the environmental consequences of an incident or emergency. These requirements are integrated into MEL plans that have been established to address all contingencies that are relevant and foreseeable at MEL. MEL's existing emergency preparedness and response procedures are contained in the following MEL plans:

1. Manchester Environmental Laboratory Chemical Hygiene Plan
2. Manchester Environmental Laboratory Health and Safety Plan (which includes the Emergency Occupancy Plan and the Environmental Response Procedure).
3. Manchester Environmental Laboratory Earthquake Preparedness and Response Plan
4. Manchester Environmental Laboratory Continuity of Operations Plan.

### **Scope**

This procedure specifies those EMS requirements that pertain to the environmental consequences of an incident or emergency. It does not address itself to other consequences that may result from an incident or emergency. All consequences are dealt with in MEL's existing emergency preparedness and response procedures.

### **Definitions**

Incident or emergency: For the purposes of this EMS, an incident or emergency consists of more than mere non-conformance in the EMS or a minor spill or release that can be corrected without invoking any of MEL's emergency preparedness and response procedures. (For correction of non-conformances and minor spills or releases, see the provisions of the EMS Non-Conformances, Corrective and Preventive Action Procedure).

## **Approach**

1. The SHEMP Manager will review the following documents and records:

Incidents and emergencies that are listed in MEL's Chemical Hygiene, Earthquake Preparedness and Response, Health and Safety Plan, and Continuity of Operations Plans.

The historical record of previous incidents and emergencies at MEL.

2. The SHEMP Manager will work with the EMS Coordinator to identify the environmental aspects for possible incidents and emergencies, and select those that under some circumstances could result in a serious environmental consequences.
3. The SHEMP Manager will review MEL emergency preparedness and response procedures and update them to ensure that the incidents and emergencies listed above are being addressed appropriately to avert or mitigate their potential environmental consequences.
4. The SHEMP Manager will periodically check that all materials, supplies and resources to respond to the environmental consequences of incidents and emergencies are on hand, labeled, and easily retrievable.
5. The SHEMP Manager will schedule and execute drills and other preparatory exercises on a timely basis. Such drills will cover environmental contingencies such as earthquakes and fires. The SHEMP Manager will review the results and assessments of drills so as to improve MEL's readiness for an incident or emergency.
6. The SHEMP Manager will review the results of actual incidents and emergencies and make necessary changes to the MEL Emergency Preparedness and Response Procedure that will improve outcomes in the future.

## **Records**

The following MEL records relate to this EMS procedure:

1. Records of incidents and emergencies that could result in environmental consequences.
2. Records of materials, supplies and resources available for the environmental contingencies of incidents and emergencies.

3. Records of drills and other preparatory exercises.

## **Environmental Management Programs Procedure**

### **Purpose**

The purpose of this procedure is to provide guidance for establishing and documenting environmental management programs (EMPs) associated with the MEL EMS. EMPs provide the guidance, the information and the references that are necessary for the efficient and effective accomplishment of the objectives and targets that have been set by the MEL EMS. While it may not be strictly necessary to document such programs, MEL has chosen to do so in order to avoid confusion and ambiguity about what needs to be done to maintain a viable EMS that will continually meet its objectives and targets.

### **Scope**

This procedure is applied to document the EMPs that MEL has implemented to attain the objectives and targets of its EMS. These objectives and targets were set primarily for MEL's significant environmental aspects, as well as for various elements of the EMS itself. The EMPs address all activities, products and services that give rise to the significant environmental aspects.

### **Definitions**

Environmental Management Program (EMP): A plan implemented to achieve objectives and targets that are set in an EMS. EMP components include timelines and resources required to achieve the objectives and targets. EMPs are amended as necessary with changing circumstances, activities and operations at MEL.

EMPs are the backbone of the EMS. Many of the requirements in the EMS can be logically housed as component parts of the EMPs. In addition to timelines and required resources, these components include:

1. Activities, products and services responsible for a given significant aspect.
2. Executive orders and legal requirements applicable to the aspect.
3. Objectives and targets for that aspect.
4. Programmatic tasks that are needed to achieve the objectives and targets.
5. Operational controls that are implemented to abate or control the environmental aspects of activities, products or services. (See separate procedure)
6. Roles and responsibilities of individuals assigned with the tasks.

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7. Required employee competency and training.
8. Performance indicators that measure progress in achieving the objectives and targets.
9. Other documents associated with the EMP.
10. Records produced by executing the EMP.

## **Approach**

MEL uses the attached template as a guide to document the information that is needed for an Environmental Management Program. The use of this template will provoke questions that are relevant for the complete documentation of an EMP. (See attached EMP template form.)

The template is completed as follows:

1. Enter the significant environmental aspect for which the management program will be developed (e.g., waste generation).
2. Enter the objectives and targets for the significant environmental aspects.
3. Enter the primary reason that the aspect was identified as significant (e.g. the aspect is regulated or has certain environmental or organizational ramifications).
4. Enter the environmental and/or organizational impacts that may result from the significant environmental aspect.
5. Enter those factors that will be used as performance indicators, or measures of achievement, to assess progress toward the EMS objectives that address the given environmental aspect. In some cases, it may be difficult to directly measure the achievement of an objective. In these cases, performance indicators may be used to measure the achievement of targets, which themselves provide a description of the organization's incremental progress toward an objective.
6. Enter the resources (required staffing levels in terms of hours, funding by appropriation, etc.) to achieve the management program. In most cases these resources will have been determined when the objectives were finalized.
7. Enter a complete description of the management program that the EMS Implementation Team has designed to achieve EMS objectives and targets. This should include existing programs and administrative and engineering controls used to achieve objectives and targets. Examples of such existing programs or procedures include MEL's existing

Laboratory Chemical Hygiene Plan, or P2 plan. For new programs and controls, it may be helpful to involve a workgroup of those individuals most familiar with the objective and aspect in a brainstorming exercise.

8. List all relevant Executive Orders and policies.
9. List all the regulatory implications of the environmental aspect.
10. Enter a list of the key tasks that have been described and list the individuals (name and title) responsible for those tasks.
11. Indicate all records generated by the management program (e.g., calibration of monitoring equipment records). In addition, indicate who is responsible for the information. Records are located with the person responsible for them unless otherwise noted.
12. Reference all documents required for the specific tasks or activities described in the EMP (such as facility operating procedures) and the persons responsible for the documents.

## **Records**

The various components of the EMPs generate a number of EMS records. These include:

1. When an EMS document is replaced with an updated document, the old document becomes a record.
2. Records that demonstrate the status of objectives and targets as EMP tasks are completed.
3. Records that reflect the assignment of roles and responsibilities, if these have been created separately from the EMP templates.
4. Records that demonstrate that resources have been allocated to the EMPs.

**EMP Template.** The following template is used to input all information necessary to create an EMP for an objective and its targets.

<b>Environmental Management Program: #</b>	<b>Title</b>	
Significant Environmental Aspect:		
Objective(s):		
Target(s):		
Reason(s) for Significance of the Environmental Aspect:		
Potential Environmental Impact(s):		
Performance Indicator(s):		
Required Budget and Resources:		
Program Description:		
Executive Orders and Other Policies:		
Specific Legal Requirements:		
Structure, Authority, Responsibility-Task(s):	Responsible Person/Group:	
Structure, Authority, Responsibility-Record(s):	Responsible Person:	
Structure, Authority, Responsibility-Document(s):	Responsible Person:	
For Competence of Person(s) Responsible and Training, Education, and Experience Requirement see table entitled "Competence Requirements of Specific Positions."		

## **External Communication of Significant Environmental Aspects Procedure**

### **Purpose**

The purpose of this procedure is to establish guidelines for the external communication of environmental information that pertains to MEL.

### **Scope**

All information related to the EMS may be communicated externally as determined by MEL management.

### **Definition**

External communication: Communication to parties or organizations external to MEL's physical site boundaries or its functions and activities on- or off-site.

### **Approach**

Consistent with its commitments in the Environmental Policy statement, MEL will promote the dissemination of relevant information regarding its environmental activities. Specifically, MEL will take the following actions under its EMS:

5. MEL shall make its environmental policy available to the public.
6. MEL will report all environmental information required by regulation to the appropriate authorities.
7. On a periodic basis, MEL will make its environmental efforts and accomplishments available to the public.
8. MEL has considered the external communication of its significant environmental impacts to the public and will do so as required by law.

### **Records**

Records generated by this procedure may include:

1. Record of policy distribution to the public.
2. Record of requests for EMS documents and records from the public.



3. Records of submissions to regulatory authorities.
4. Records of environmental reports to the public.
5. Records of any external communication regarding significant environmental aspects.

## **Responding to External Interested Parties Procedure**

### **Purpose**

The purpose of this procedure is to establish a reliable and consistent process for receiving, documenting and responding to relevant information, communication or requests from external interested parties.

### **Scope**

At MEL all external input regarding environmental performance will be considered as being from an interested party. Each input will be processed in accordance with this procedure.

### **Definition**

Interested party: Individual or group concerned with or affected by the environmental performance of the organization.

### **Approach**

External input concerning environmental performance shall be directed to the EMS Coordinator, Laboratory Director or the SHEMP Manager who will confer with appropriate staff to evaluate the substance of the external communication.

Collectively, they will make a determination of whether the communication pertains to an existing significant environmental aspect, or to one that may need to be added into the EMS. Following this evaluation, an appropriate response will be prepared and sent through MEL management to the external, interested party. MEL management shall ensure that the response is timely (within Region 10 customer service guidelines for correspondence directed to EPA).

The EMS Coordinator will consider external communications when working with MEL management and staff to establish and review environmental objectives and targets for the EMS and will implement any necessary changes to the EMS.

### **Records**

Records generated from the execution of this procedure include:

1. External communications received (in mail or phone logs or meeting notes).
2. Records of consideration of external communications and any decisions taken with respect to them and documentation or copies of responses to external communications.

## **Internal Communications Procedure**

### **Purpose**

The purpose of this procedure is to establish requirements for internal EMS communication between levels and functions at MEL and to enumerate the mechanisms that exist for information flow within the facility.

### **Scope**

At MEL, internal EMS communication reaches all employees, is practiced to strengthen and sustain the EMS, and is designed to include information on all elements of the EMS; most importantly, significant environmental aspects, objectives and targets, legal requirements, and roles and responsibilities.

### **Definitions**

Internal EMS Communication: Communication that is intended for managers and employees to further the EMS goals at MEL. (Internal EMS communication does not include communications to Headquarters, other Regional Laboratories, the Office of Environmental Assessment, other Region 10 offices or parties external to MEL.)

### **Approach**

1. Responsibility for ensuring the smooth and sufficient flow of internal EMS communications rests with the EMS Coordinator, who may work through others to effect this end.
2. The EMS Coordinator will establish lines of communications to gather pertinent data on a periodic basis to monitor the EMS effectiveness.
3. Requirements specified in the EMS procedures will be communicated as detailed in those procedures.
4. Communication of EMS-specific instructions is the joint responsibility of the EMS Coordinator and lab management.
5. The EMS Coordinator will ensure the distribution and communication of the Environmental Policy to all MEL employees.

6. The EMS Coordinator will arrange for environmental awareness training of all employees and competence training for employees whose work may involve a significant environmental aspect.
7. Whenever possible, EMS communications will be incorporated into existing communications including: safety meetings, staff meetings, e-mail, bulletin board postings, and internal memorandums.

### **Records**

The following records relating to EMS internal communications will be kept at MEL:

1. Record of environmental policy distribution to employees.
2. Records of employee EMS training with dates, names of participants and training content.
3. Minutes of meetings where EMS matters were discussed or communicated.
4. Copies of postings, memorandums or management bulletins that cover EMS topics.

## **Identifying Legal and Other Requirements Procedure**

### **Purpose**

The purpose of this procedure is to ensure that MEL staff and management understand the legal and other requirements that are applicable to the environmental aspects (hazards) of their activities, products, and services. This knowledge is incorporated into the EMS and will be used to identify significant aspects and to establish objectives and targets for those aspects at all relevant levels and functions of the organization.

### **Scope**

All aspects that have been identified for MEL's activities, products and services are subject to this procedure.

### **Definitions**

Legal requirements include those promulgated by federal, state and local authorities. Other requirements include those issued by MEL management, such as Laboratory policies, those to which MEL voluntarily subscribes, and those from other authorities that MEL has agreed to comply with (e.g. National Environmental Laboratory Accreditation Council).

### **Approach**

1. The responsibility for ensuring that legal and other requirements have been identified for the environmental aspects of MEL's activities, products and services rests with the Safety, Health, and Environmental Management Program (SHEMP) Manager working through the EMS Team. The EMS Team uses a variety of techniques to identify those aspects that are regulated. In some cases, a brainstorming exercise similar to that conducted when identifying aspects may be effective, where the individual responsible for regulatory compliance is available and is confident of the regulatory implications of each impact. In other cases, the Office of Regional Council (ORC) can review each impact and provide the EMS Team with the necessary regulatory information. In addition, the Facility Manager is aware of the regulatory requirements and can link these to the impacts. Any of these methods is suitable as long as it can provide a high degree of certainty regarding the regulatory implications of each potential environmental impact.
2. These legal and other requirements are integrated into the EMS by designating their associated environmental aspects as significant, by applying them in the establishment of objectives and targets for those aspects, and by then creating Environmental Management Programs (EMPs) to achieve those objectives and targets.
3. The SHEMP Manager ensures that this information is current by periodically reviewing

regulatory updates, and by seeking assistance from ORC and EPA Headquarters, as well as regulatory experts on-site. Approaches to remaining current on applicable regulatory requirements may include:

- Subscribing to *Environmental Compliance Alert*, *Bureau of National Affairs*, and *the Federal Register*; publications that are dedicated to regulatory information and updates,
  - Periodic contact with state and local regulatory officials,
  - Consulting with compliance professionals that provide services to the location that are related to regulatory compliance,
  - Periodic attendance at environmental training courses that include regulatory updates and compliance issues,
  - Identifying local requirements through applicable permits,
  - Other requirements may be identified and documented in contractual arrangements and brought to the attention of the SHEMP Manager by MEL contracting officers.
4. The legal requirements will be reviewed at least annually by the SHEMP manager to ensure agreement with new laws. All updates will be reflected in appropriate sections of the EMS and the main list of requirements will be maintained as an EMS document.
  5. The SHEMP manager will maintain the current applicable legal and other requirements in the EMS Legal and Other Requirements document.
  6. Employees that are involved with activities, products or services associated with significant environmental aspects will be acquainted with the applicable legal and other requirements through the Environmental Management Programs (EMPs) that are implemented for those aspects. Employees also have access to the legal and other requirements that are applicable to the significant environmental aspects of their tasks or assignments through the documentation that is maintained by the EMS Coordinator.
  7. Novel environmental aspects that arise from new or revised activities, products or services will be submitted for evaluation by the EMS Coordinator to ascertain the existence of any regulatory requirements that may apply to them. Those that have regulatory significance are then incorporated in the EMS as significant environmental aspects.

## **Records**

1. Outdated lists of legal and other requirements.

## **Management Review Procedure**

### **Purpose**

The purpose of this procedure is to provide guidelines for top management review of the EMS to ensure that it the EMS continues to be effective, suitable and adequate and to make any decisions or take any actions necessary for its continual improvement.

### **Scope**

The management review of the EMS will be conducted on a yearly basis unless circumstances warrant a more frequent review. The review will cover all elements of the EMS and will include sufficient information for management to make an informed decision on whether the EMS continues to be suitable, adequate and effective for its intended purposes, and whether decisions need to be made or actions taken to ensure its continual improvement.

### **Definitions**

**Top management:** MEL's top managers, for purposes of the EMS, are found within the boundaries of the area or functions covered by the scope of the EMS. They have authority over all the areas and functions that the EMS impinges on, and their authority is sufficient to initiate actions and allocate resources without further review or approvals. This level of authority allows for the fact that their discretion may be circumscribed by budgets that have been previously approved by higher authority (i.e., top managers in the EMS need not have absolute power to allocate any resources and initiate any actions). They simply need sufficient authority to allocate or reallocate the resources that have been approved for operations within their purview and that are to be used through their own discretion. For the purpose of this EMS, top management consists of the Directors of the USEPA Region 10 Laboratory and the Washington State Department of Ecology Laboratory and the ESAT Team Leader.

**Effectiveness:** Refers to the system's progress in accomplishing the objectives and targets set for the EMS. If progress is slower than expected or if operational controls fail more often than is expected or that is acceptable, then the system may be considered ineffective for its intended purposes. It is important to remember that effectiveness measures our achievement of our own objectives and targets. In other words, effectiveness is a relative term depending on what we set out for ourselves. The only exception to this is regulatory compliance. If we fail to achieve regulatory compliance in a relatively short period of time, the system is likely to be considered ineffective regardless of whether other objectives and targets are being achieved.

**Suitability:** Refers to the nature of the EMS and whether that continues in accordance with the nature of our organization. For example, if internal communication relies on supervisor delivery



when most of the employees have e-mail capability and can be reached directly, then the system is no longer suitable in that regard. If the chemical management program specifies that employees have responsibility for managing chemicals but the number and volume of chemicals has increased to the point that it is now a serious distraction for them, then the system is no longer suitable and other arrangements need to be considered.

**Adequacy:** Refers to the sufficiency of the arrangements for the EMS. For example, if the resources allocated to the EMPs are not sufficient to achieve the objectives and targets set for them, then the EMS is inadequate with regard to resources. If new employees are not given timely awareness or competence training before they are assigned to their tasks, then the EMS is inadequate with training.

### **Approach**

On an annual basis (or earlier if warranted), top management at MEL will conduct a review of the EMS.

1. The EMS Coordinator will prepare the necessary input to be considered in the review. Items to be considered in the review will include the following:
  - a. EMS audit results,
  - b. Results of monitoring and measurement of environmental indicators,
  - c. Progress towards achievement of objectives and targets (i.e. performance indicators),
  - d. Regulatory compliance status,
  - e. History of corrective and preventive actions,
  - f. Any other relevant information on the EMS.
2. Upon review of the above information, top management shall make a determination on the continuing effectiveness of EMS implementation and specifically on the EMS' ability to achieve its objectives and targets. Top management will also consider whether the system continues to be adequate and suitable for its intended purpose.
3. Having made these determinations, top management will then give directions to the EMS Coordinator on any necessary changes to the EMS to ensure its continual improvement. These may be direct changes to the environmental policy, objectives and other elements of the environmental management system.

4. The three terms: suitable, adequate, and effective, and management's determination on each, will appear in the minutes of the management review meeting.

## **Records**

Records generated by this review include:

1. Minutes or notes of the management review that cover
  - a. attendance,
  - b. information presented,
  - c. determinations made regarding continuing effectiveness of the system,
  - d. the EMS's ability to achieve its objectives and targets,
  - e. adequacy and suitability of the system,
  - f. decisions made on actions to be taken.
2. Records of follow-up actions initiated and completed to implement decisions taken during the review.

## **EMS Non-Conformances, Corrective and Preventative Actions Procedure**

### **Purpose**

The purpose of this procedure is to define the responsibility and authority for investigating EMS non-conformance, for taking action to mitigate any impacts caused by non-conformance, and for initiating and completing corrective and preventive action.

### **Scope**

This procedure applies to MEL's EMS and includes off-site activities.

### **Definitions**

The terms non-conformance and non-compliance have specific meanings within the EMS:

1. Non-conformance: Any deviation from established procedures, programs and other arrangements related to the EMS. It may include non-compliance with regulations, but not every situation of non-compliance is necessarily non-conformance with the EMS. An EMS audit (internal or third-party) makes findings of non-conformance.
2. Non-compliance: Failure to meet regulatory or other requirements that have been imposed on MEL. A compliance audit makes findings of non-compliance.

### **Approach**

1. The performance indicators and internal and external EMS and compliance audits will be used to detect non-conformance with the EMS.
2. Whenever non-conformance with the EMS is detected, the EMS Coordinator shall be notified about the non-conformance.
3. The EMS Coordinator shall confer with the affected staff manager on actions to take to mitigate any impacts caused by the non-conformance and for initiating and completing corrective action.

4. Corrective actions will be taken by the appropriate MEL staff and/ or managers. The procedure for conducting corrective actions is the same procedure used to address non-conformance findings in an EMS audit.
5. Any corrective action taken to eliminate the causes of actual and potential non-conformance shall be appropriate to the magnitude of the problems and commensurate with the environmental impact encountered.
6. The affected manager is responsible for ensuring that the corrective action is completed as agreed.
7. The outcome of the corrective action will be assessed to determine if it resolved the problem and further steps will be taken until the problem is resolved.
8. The EMS Coordinator shall record any changes to the documented procedure for corrective action if that is warranted.
9. The EMS Coordinator will confer with the affected manager to take all necessary steps to ensure that the non-conformance does not recur. The procedure for preventive action is the same one used for findings of non-conformance in an EMS audit.
10. The EMS Coordinator shall record any changes to the documented procedure for preventive action if that is warranted.
11. The affected staff manager is responsible to ensure that the preventive action is completed as agreed with the EMS Coordinator.

## **Records**

Records generated by this procedure include the following:

1. Records that list the instances of non-conformance with the EMS, the date of occurrence, date of corrective action, and date of completion of preventive action.
2. Records that reflect the analysis of the non-conformance and the corrective and preventive actions that were taken with respect to it.
3. Records of changes made to the procedure(s) for corrective and preventive actions.
4. Records of non-compliance.

### **Determining Objectives and Targets Procedure Determining Objectives and Targets Procedure**

*M01D: EMS Manual, Last Updated: 8/2/2006, page 44/175*

## **Purpose**

The purpose of this procedure is to provide guidance for setting objectives and targets for the EMS.

## **Scope**

This procedure is to be used when setting objectives and targets for the EMS. Objectives and targets are set for all significant environmental aspects and may be set for other elements of the EMS such as training, auditing, employee awareness, etc. The objectives and targets extend to all levels and functions of the organization where they are applicable.

## **Definitions**

**Environmental objective:** The overall environmental goal, arising from the environmental policy, an organization sets for itself to achieve, and which is quantified where practical. For example, a quantified objective might be "recycle 50% of solid waste generated".

**Environmental target:** A detailed performance requirement, quantified where practical, applicable to the organization or parts thereof, that arises from an environmental objective and that needs to be met in order to achieve that objective. For example, for the quantified objective "recycle 50% of solid waste generated", a quantified target might be "recycle 70% of office paper".

**Performance Indicator:** Evidence that is used to assess whether a target has been met. Each target requires at least one performance indicator. For example, for the quantified target "recycle 70% of office paper", the performance indicator might be "weight of recycled paper compared to weight of paper used."

**Interested party:** An individual or group concerned with or affected by the environmental performance of an organization.

**Environmental policy:** A statement by the organization of its intentions and principles in relation to its overall environmental performance that provides a framework for action and for setting its objectives and targets.

**Continual improvement:** A process of enhancing the environmental management system to achieve improvements in overall environmental performance in line with the organization's environmental policy. EMS continual improvement is mandated.

## Approach

Objectives and targets are accomplished through the implementation of Environmental Management Programs (EMPs) and are thus specified and documented within the EMP. MEL will establish and maintain written objectives and targets for significant environmental aspects, at each relevant function and level within the organization.

1. Objectives and targets are set for significant aspects and may also be set for other elements of the EMS. Any number of EMPs may be required to achieve the objectives and targets, although it is also possible that one EMP may address multiple objectives and targets. It is also possible to have multiple objectives and targets for the same significant environmental aspect.
2. Objectives and targets may be set to maintain an attained level of achievement for a given aspect or other element of the EMS (e.g. compliance with an environmental law).
3. Where appropriate, the EMS Team sets targets for each objective to further define the incremental steps necessary to achieve the objective. Targets also specify dates to initiate the work and attain the associated goal.
4. Objectives and targets must be consistent with the commitments in the environmental policy of the organization. Consistent with its environmental policy, in setting objectives and targets, MEL will consider:
  - the views of interested parties,
  - the prevention of pollution,
  - compliance with applicable regulations,
  - the goal of continual improvement,
  - its' technological options, and
  - its' financial, operational and organizational requirements.
5. Other considerations in setting objectives include quantification and time frames. Whenever possible, objectives and targets should be set in quantitative terms with specific time frames for accomplishment to facilitate performance monitoring and trends analysis. However, quantification is not an absolute requirement of objectives. MEL will set objectives for significant environmental aspects irrespective of their ability to be directly quantified. In some cases, trends analysis may not be possible because an environmental aspect has not been previously measured, and therefore there is no baseline against which to measure performance. In these cases, the first cycle of measurements will provide a baseline against which to quantify future performance.
6. Targets describe in general detail how objectives will be achieved, including the operations that will contribute to an objective and the dates by which they should be completed. Targets can provide performance metrics in cases where objectives cannot be quantified. For example, where the objective is to replace hazardous chemicals with less hazardous substitutes, the first target may be to complete a draft plan within six months

of setting the target; and the second target may be to finalize the substitution plan within one year. The achievement of these targets then becomes the metric by which performance is measured.

7. MEL will establish performance indicators (measures) when setting objectives and targets and will include these within the EMP documentation. This is important so as to demonstrate that the EMS is effective in achieving all its intended purposes, most importantly, the attainment of objectives and targets to meet the organization's environmental policy. Performance indicators will be set for all objectives and targets, with every target having at least one associated performance indicator. Performance indicators may include measures of environmental performance, compliance, pollution prevention, and may also be set for elements of the EMS for which MEL has established objectives and targets. Performance indicators will be tracked as part of the EMPs to ensure that they will attain the objectives and targets within the specified timeframes. Progress towards achieving the objectives and targets shall be sufficient over time so that the end goal can be met in accordance with the timeline specified in the EMP.
8. In setting objectives and targets, the EMS Team estimates the additional resources (in terms of staffing time and funding) needed to achieve the performance levels desired and presents this information to top management. Top management applies financial, operational, and organizational considerations to approve their incorporation into the EMS. At this point, the objectives and targets become formal objectives and targets for the organization.
9. MEL will not set objectives and targets for non-significant environmental aspects. However, the EMS Coordinator will periodically survey the employees' environmental awareness and their commitment to carrying out their jobs in an environmentally sensitive manner. The results of these surveys will measure the overall environmental culture that prevails at and is relied upon by MEL to address the non-significant environmental aspects.

## **Records**

MEL will create and maintain records that pertain to the setting of objectives and targets for the EMS. These will include:

1. The views of interested parties.
2. Records that shows the process of consideration for setting objectives and targets.

## **Establishing Operational Controls Procedure**

### **Purpose**

The purpose of this EMS procedure is to provide guidance for establishing the operational controls that are to be applied to the organization's activities, products or services that exhibit significant environmental aspects.

### **Scope**

This procedure is used to establish the operational controls that are applicable to all activities, products or services that are associated with significant environmental aspects at MEL.

### **Definitions**

Operational controls: Operational controls are broadly defined to include technological (e.g., shut-off valves) and administrative (e.g., operator intervention, standard procedures) controls. Operational controls are applied to activities, products and services to prevent the environmental impact they exhibit from occurring. For example, for the activity "Change oil in pumps", appropriate operational controls might be "inspection, use of standard operating procedures, log book for inspection and oil change".

Activity Group: A group of specific, individual activities that together are the source of an aspect. For example, for the aspect "Waste Generation", the activity group might be "lab analysis" and an individual activity might be "sample bottle disposal".

### **Approach**

Operational controls are required to ensure that activities, products and services maintain stability within specified criteria. Operational controls are included in the Environmental Management Programs (EMPs) or may be referenced in them. They are integral to the EMP for each environmental aspect. Operational controls reference the EMPs they support. The attached OC Template can be used to document the elements of operational controls that have been implemented.

The following steps are taken to identify operational controls associated with the activities, products or services of each significant environmental aspect:



1. Each significant environmental aspect shall be reviewed in conjunction with its activities, products or services to determine whether operational controls (either technological or administrative) are needed for those activities, products or services.
2. In doing the review, special attention shall be given to those characteristics of activities, products or services that may give rise to the needs for operational controls.
3. Where applicable, documentation of the operational controls will specify their operating criteria, their maintenance plans, and the actions to be taken when they may be interrupted or might otherwise fail. Any documentation associated with operational controls must be kept current and accessible. Documentation is monitored by the person assigned responsibility for the operational control as indicated on the operational control form.
4. When necessary, operational controls will also be applied to the identifiable significant environmental aspects of goods and services that are received from external sources and used by MEL. When appropriate, operational controls that need to be implemented by the external source shall be duly communicated to those sources. (See EMS communications procedures related to this requirement.)
5. Management is responsible for ensuring that operational controls are implemented for those activities, products or services that have significant environmental aspects associated with them.
6. Operational controls will be designed and written prior to the start of work to achieve a new target.
7. Indicate who is responsible for the information. Records are located with the person responsible for them unless otherwise noted.

## **Records**

The following records will be created for operational controls:

1. Records pertaining to operating criteria.
2. Records of any actions taken in the event of interrupted or failed controls.
3. Records that demonstrate the functioning of operational controls.

**OC Template.** The following template is used to record all information necessary for Operational Controls.

<b>Operational Control #</b>	<b>OC Name</b>	
Aspect:		
Activity Group:		
Activities:		
Operational Controls such as technological, operational, procedural (briefly describe):		
Maintenance plan(s) for the operational controls (including frequency):		
Actions to be taken if operational controls fail:		
Record(s):	Responsible Person:	
Responsibility to ensure controls work and records are kept, Task:	Responsible Person:	
For Competence of Person(s) Responsible and Training, Education, and Experience Requirement see table entitled "Competence Requirements of Specific Positions."		

## **Records Management Procedure**

### **Purpose**

The purpose of this procedure is to specify requirements for retaining and maintaining EMS records.

### **Scope**

This procedure applies to all records generated through the EMS. Records are essential to document the performance of the EMS. This includes all data necessary to determine if objectives and targets are being met as well as other information on EMS planning and implementation.

### **Definitions**

Record: Information or data on a particular subject that is collected and preserved. Examples of records include the following: drawings, specifications, contract language, meeting minutes, deviation tickets, checklists, organizational charts, photos, training records, complaints, maintenance records, incident reports, audits, etc.

Retention period: The length of time that records will be kept available.

### **Approach**

1. Records shall be legible, identifiable, and dated with the creation date.
2. Records shall be kept as close to where they are generally used as is feasible and practical. Records shall be stored and maintained to be readily retrievable and protected against damage, deterioration and loss.
3. Records maintained exclusively for the EMS will be maintained for a minimum of five years unless otherwise specified. Retention times for environmental records shall comply with regulatory requirements.
4. Where necessary, unique record keeping or retention requirements shall be specified for the records identified in the EMPs, OCs or EMS procedures.

## **Records**

1. Copies of superseded versions of MEL records management procedures.
2. Communications regarding discarded records.

## **Identifying Significant Environmental Aspects Procedure**

### **Purpose**

The purpose of this procedure is to identify the significant environmental aspects of MEL activities, products and services in order to set objectives and targets for the environmental management system (EMS) that can be achieved through the implementation of environmental management programs (EMPs).

### **Scope**

This procedure is applied to all activities, products and services that are internal to and under the control of MEL. It is applied equally to those aspects at MEL that originate from external sources.

### **Definitions**

Environmental aspect: Element of an activity, process or service that can interact with the environment. The environmental aspect of an activity is that part of it that creates a possibility for an environmental impact. As such, it is equivalent to the concept of a “hazard” in safety, which is also defined as the mere possibility of a negative event.

Significant environmental aspect: An environmental aspect that has or can have a significant environmental or business impact, i.e., one that can potentially cause a significant environmental or operational impact.

Environmental impact: Any change to the environment, whether adverse or beneficial, wholly or partially resulting from the facility’s activities, products or services. A potential negative environmental impact is equivalent to the concept of “risk” in safety, which assigns a probability and consequence to the possible negative event that may result from a “hazard”.

### **Approach**

The approach enumerated below reflects the method developed in *Module 1, Significant Aspects, Objectives and Targets of US EPA’s Environmental Management System Implementation Training Course*. That training module is incorporated here by reference and represents a further elaboration of the approach used by the Manchester Environmental Laboratory to identify its significant environmental aspects. The approach below is a very condensed version of the

contents of the training module.

1. Create a baseline list of MEL activities, products, and services that have the possibility of interacting with the environment, (e.g., possess environmental aspects) together with their environmental aspects.
2. Using the baseline list, aggregate all activities, products and services by environmental aspect.
3. For each of these aspects, state the potential environmental impact by highlighting the probability and consequence of the aspect's occurrence.
4. Ascertain the regulatory or other requirements that may pertain to a given aspect when considered together with each activity, product or service it is associated with and note each combination that has a regulatory or other requirement. Those aspects that are so highlighted are designated as significant aspects. Document the regulatory and other requirements that apply to each aspect.
5. Establish significance criteria for potential impacts by establishing levels for probability and consequence that fall into low, medium and high levels.
6. Compare the potential environmental impacts against the significance criteria to determine which aspects should be designated as significant. Where a potential environmental impact meets or surpasses the minimum criteria for designating as "significant", then its associated aspect is considered significant.
7. Create a final list of all significant aspects that have been so designated either because they have regulatory or other requirements that make them so or because they meet or surpass the significance criteria established for the MEL.
8. Whenever a new activity, product or service is initiated at MEL, the requirements of this procedure will be applied to it to ascertain if any new significant environmental aspects have been introduced.
9. This procedure is also applied to activities, products and services at MEL that originate from external sources (e.g., suppliers). Significant environmental aspects on MEL premises that originate from such sources shall be managed like all other significant environmental aspects. MEL may take steps to notify those external parties over which it has some influence to mitigate any aspects that may reasonably be mitigated at the source. Where no such influence exists or where mitigation at the source is infeasible, MEL will address such aspects within its own EMS.

This procedure will be applied as necessary to ensure the EMS addresses all significant aspects but not less than once per year to maintain the list's relevance.

## **Records**

The Environmental Management System Coordinator will maintain the following records.

1. A table listing all of MEL's activities, products and services; their associated environmental aspects; and their associated potential environmental impacts. The table is split into significant and non-significant impacts and grouped by aspect. Aspects with regulatory or other legal requirements are noted as such.
2. Documentation of the method used to ascertain which environmental aspects are significant.
3. Documentation of any legal and other requirements for significant environmental aspects

## **Communicating with Suppliers and Contractors Procedure**



## **Purpose**

The purpose of this procedure is to communicate information and/or requirements related to the identifiable environmental aspects of goods and services used by MEL to its suppliers and contractors in accordance with the requirements of MEL's Environmental Management System.

## **Scope**

MEL will communicate its general concern for the environment and desire to conduct business operations in an environmentally sound manner to its suppliers and contractors. MEL may also communicate specific procedures and requirements to those suppliers and contractors that provide goods and services associated with significant environmental aspects.

## **Definition**

Suppliers and contractors: Organizations or individuals that provide supplies, materials, services and other tangible goods to MEL.

## **Approach**

1. Annually, a USEPA MEL Purchasing Officer sets up purchasing agreements with its major suppliers and contractors, sends them the EMS policy statement and communicates to those suppliers that, where possible, they should select the available option that minimizes the potential environmental impact of that product.
2. Where possible, the USEPA MEL Purchasing Officer chooses needed items from the USEPA "green purchasing" list. The WDOE Purchasing Coordinator selects items in conformance with the Department and State's sustainability program.

## **Records**

Records generated by this procedure include:

1. Logs of suppliers' and contractors' names and the dates MEL's EMS information was communicated to them.

## **Tracking Environmental Performance Procedure**

### **Purpose**

The purpose of this procedure is to provide guidance for:

1. Selecting performance indicators for the EMS objectives and targets,
2. Establishing performance baselines for those objectives and targets,
3. Selecting measurement methods to track progress in attaining those objectives and targets.

### **Scope**

This procedure will be applied to the objectives and targets that have been set for the EMS. They may include objectives and targets for MEL environmental performance as well as those set for the performance of the EMS itself.

### **Definitions**

Environmental performance: Measurable results of the environmental management system, related to an organization's control of its environmental impacts, based on its environmental policy, objectives and targets.

Continual improvement: The process of enhancing the environmental management system to achieve improvements in overall environmental performance in line with the organization's environmental policy.

Monitoring: A systematic process of tracking parameters.

Measurement: A systematic method for assessing the quantity or quality of a parameter so as to determine performance.

### **Approach**

#### **Selection of Indicators:**

One of the steps in establishing environmental management programs (EMPs) for significant aspects involves identifying indicators of performance. Performance indicators are selected for the objectives and targets in the EMP and for any other objectives and targets specified for the EMS. The indicators allow the organization to measure progress towards the attainment of

*M01D: EMS Manual, Last Updated: 8/2/2006, page 58/175*

objectives and targets. One factor to consider when selecting indicators for regulatory targets is the regulatory language that often specifies the unit of measure that needs to be monitored and controlled for the given environmental aspect. For example, air emissions may include particulates and volatile organic compounds and can be measured by volume, concentration, and periodicity; recyclables can be measured by weight, volume, or value; hazardous waste can be measured by toxicity, corrosiveness, flammability, combustibility, weight, etc.

Examples of indicators for the EMS may include: the percentage of employees that have not received EMS awareness training; the time lapse between identifying non-conformance with an EMP or EMS requirement to implementing the corrective action; the number of employees that have received competency training relative to their responsibilities with respect to significant environmental aspects.

### **Establishing Baselines**

Having selected the performance indicators, the next step is to establish performance baselines to measure progress from a specific starting point. Baselines may not be appropriate for some objectives and targets where, due to the nature of the activity, measurement over time may not be indicative of meaningful progress.

### **Measuring Indicators**

Each identified performance indicator must specify the technological and/or procedural methods to be employed to monitor and measure that indicator so as to track progress. For example, if temperature is the indicator, the technological measurement method could be a thermometer, and the procedural method would involve the frequency of measurements or location of measurements. It is also important to specify the records that will be created with this information, who is responsible for record collection and maintenance and for how long such records will be kept.

### **Utilization of EMS Performance Data**

All information collected from monitoring and measuring progress in attaining the objectives and targets of the EMS is a required input into the periodic management review. The effectiveness of the EMS is in large measure determined by its ability to meet the objectives and targets.

### **Records**

The following EMS performance records are created at MEL:

1. Superseded revisions of EMPs.
2. Records that reflect the baselines for EMS objectives and targets.
3. Records of measurements.
4. Records of the status of objectives and targets.

### **Environmental Training of Employees Procedure**

*M01D: EMS Manual, Last Updated: 8/2/2006, page 59/175*

## **Purpose**

The purpose of this procedure is to provide guidelines for the conduct of periodic employee environmental awareness and competency training (when required). Such training is the foundation of employee involvement and commitment to environmental protection as an ongoing responsibility of their work. It is fundamental to the efficient and effective implementation and execution of the EMS at MEL.

## **Scope**

To further the EMS, MEL will periodically conduct two types of training:

1. All employees of MEL, whether or not they are associated with significant environmental aspects, shall receive general environmental awareness training.
2. Competence training is provided when required to ensure the proficiency of employees whose work may create a significant environmental impact.

## **Definitions**

Awareness training: EMS training that is provided to all employees irrespective of whether they are associated with the significant environmental aspects of MEL's work.

Competence training: Training provided to employees whose work is associated with significant environmental aspects. Such training is indicated when an employee is not competent on the basis of previous training, education, or experience to address responsibilities relative to a significant environmental aspect.

## **Approach**

General Environmental Awareness Training:

The objectives of general environmental awareness training are to make all MEL employees conscious of:

1. The importance of conformance with the environmental policy and procedures and with the requirements of the environmental management system.
2. Their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirements of the environmental management system.

3. The potential consequences of departure from specified operating procedures.

Awareness training will be conducted for all employees as part of the initiation of the EMS. The EMS Coordinator will provide EMS orientation and awareness training to new MEL staff and managers. On an annual basis, all employees will receive refresher environmental awareness training that re-emphasizes the required elements.

#### Competence Training:

Personnel that perform tasks that can cause significant environmental impacts shall be competent on the basis of appropriate education, training and/or experience. Such personnel shall receive competency training when the supervisor and/or EMS Coordinator determine that such training is needed to address the significant environmental aspect(s) of the work assignments. Such competency training will include:

1. The significant environmental impacts, actual or potential, of their work activities and the environmental benefits of improved personal performance.
2. Their roles and responsibilities with respect to the significant environmental aspect that they are personally involved with as an ongoing element of their work tasks and duties.
3. Their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirements of the EMS, including emergency preparedness and response requirements.
4. The potential consequences of departure from specified operating procedures.

The declaration of employee competence is specified in each EMP that is implemented to achieve objectives and targets. Training records will provide evidentiary proof of such training. In many cases, competence training will be satisfied by existing Health and Safety training required by OSHA and/or environmental regulations.

When competence training is required, it will be conducted before the employee begins the assigned function. It is the responsibility of the immediate supervisor to ensure that this training is conducted.

#### **Records**

The following records are retained at MEL:

1. General employee training.
2. EMS awareness training including date, attendance, and content.
3. Competence training including date, attendance, and content.

## **Section 5 - EMS Programs and Controls**

This section includes information that allows the user to locate relevant documentation associated with the following EMS areas. The official versions of these documents are located on the USEPA Region 10 Laboratory internet website.

### **5.1 EMS Audit Program**

The EMS Audit Program describes how internal EMS audits are conducted at MEL, including:

- Audit program scope
- Audit program objectives
- Roles, authorities, and responsibilities
- Audit qualification and training
- Auditor schedule

### **5.2 Environmental Management Programs (EMPs)**

EMPs are temporary action plans designed to achieve MEL's EMS objectives and targets. EMPs are created as needed and retired as the targets are completed.

### **5.3 Operational Controls (OCs)**

OCs are implemented for MEL operations, activities, processes, products, and services with significant environmental aspects.

1. Boiler/Emergency Generator
2. Chemical Use
3. Fuel Tank Filling
4. Hazardous Waste
5. ODS
6. Paper
7. Solid Waste Generation
8. Wastewater
9. Water Consumption

## 2006 EMS Team Members

DCN	Document Name X= Primary Responsibility	Carol Haines	Stephanie Bailey	Pat Coogan	Linda Donahue	Karin Feddersen	Stephanie Le	Rob Manos	Aprille Leaver	Tony Morris	Steve Reimer	Jeff Westerlund	Edlin Limmer
M09C	Legal and Other Requirements	<b>X</b>											
O20B	Boiler OC							<b>X</b>					
O21A	ODS OC							<b>X</b>					
O22B	Chemicals OC									<b>X</b>			
O27B	Hazardous Waste OC									<b>X</b>			
O30B	Paper OC								<b>X</b>				
O26A	Fuel Tank Filling OC							<b>X</b>					
O32B	Solid Waste OC		<b>X</b>										
O33B	Wastewater OC									<b>X</b>			
O34B	Water Consumption OC						<b>X</b>						
O35A	EMS-Related Assistance OC		<b>X</b>										
E26A	Methylene Chloride EMP										<b>X</b>		
E27A	Energy Consumption EMP							<b>X</b>					
E28A	Earth Day, Every Day EMP		<b>X</b>										
		Carol Haines	Stephanie Bailey	Pat Coogan	Linda Donahue	Karin Feddersen	Stephanie Le	Rob Manos	Aprille Leaver	Tony Morris	Steve Reimer	Jeff Westerlund	Edlin Limmer

As of 02/01/2006

<b>Environmental Management Program #E26A</b>	<b>Methylene Chloride</b>
Significant Environmental Aspect: Hazardous material use and disposal	
Objective(s): Decrease use of hazardous solvent	
Target(s): <b>Decrease Methylene Chloride use in water extractions by 50% per sample in 2006, over base year 2004.</b> Initiate and complete in CY2006.	
Reason(s) for Significance: Appears on the high significance report, existing program, Executive Orders and legal requirements.	
Potential Environmental Impact(s): Hazardous waste generation, environmental contamination.	
Performance Indicator(s) for corresponding targets: Decrease volume of Methylene Chloride purchased and disposed of (relative to sample extraction workload).	
Budget and Resources for corresponding targets: Organic Chemistry staff: 100 hrs/yr Extraction equipment: \$5,000 Lab Directors: 5 hrs/yr QA Coordinators: 15hrs/yr Purchasing Officers: 10 hrs/yr Hazardous Waste Coordinators: 10hrs/yr	
Program Description: MEL currently uses a stir bar method for water extraction. Developed over twenty years ago, this method requires large amounts of Methylene Chloride (MC). An environmental contaminant and suspected carcinogen, MC is the largest volume hazardous solvent used at MEL. Minimizing its use will reduce hazardous waste generation and decrease hazardous material production. Organic chemists from EPA, ESAT and WDOE will seek to replace the stir bar method with solid phase extraction or other liquid-liquid extraction methods. This change will require method development, and possibly new equipment, to ensure project goals can be met by each agency. The goal of MEL is to decrease MC usage by 50% per sample over base year 2004.	
Executive Orders, Guidelines, and Other Policies: EO 13101 Sections: 101, 102, 401 EO 13148 Sections: 204, 205, 502, 503	
Specific Legal Requirements: WAC Chapters 173-303 40 CFR Part 156, 1910.1052 (pg 4)	
Structure, Authority, Responsibility-Task(s) and Responsible Person/Group: 1. Investigate the use of alternate water extraction methods – Organic Chemists (Peggy Knight, Randy Cummings, Megan Pickett, Doug Wood, Theresa McBride, Jeff Westerlund,	



Bob Carrell, Kelly Donegan, Dannette Hanttula, and Cherlyn Milne), QA Coordinators, Lab Directors, Hazardous Waste Coordinators. Complete by 3/31/06	
Structure, Authority, Responsibility-Record(s): 1. Purchase records 2. Disposal Records 3. Water extractions log book	Responsible Person: 1. Purchasing Officers 2. Hazardous Waste Coordinator 3. Organic Chemists
Structure, Authority, Responsibility-Document(s):	Responsible Person:
For Competence of Person(s) Responsible and Training, Education, and Experience Requirement see table entitled "Competence Requirements of Specific Positions".	

<b>Environmental Management Program #E27A</b>	<b>Energy Consumption</b>
Significant Environmental Aspect: Electricity and fuel consumption	
Objective(s): Decrease energy consumption	
Target(s): <b>Reduce the Laboratory's FY2006 consumption of electricity, diesel fuel and propane by 2%* over base year FY2003.</b> Initiate and complete by 9/30/06	
Reason(s) for Significance: Appears on the high significance report, Executive Orders, The Energy Policy Act of 2005.	
Potential Environmental Impact(s): Use of natural resources, environmental contamination	
Performance Indicator(s) for corresponding targets: Electricity, diesel, and propane purchase records.	
Budget and Resources for corresponding targets: Facility Manager: 50hrs/yr Lab Directors and Supervisors: 5 hrs/yr Energy Coordinator: 20 hrs/yr Laboratory Employees: 50hrs/yr SHEMP Manager: 5hrs/yr EMS Coordinator: 30hrs/yr	
<p>Program Description: MEL provides workspace for three different organizations and two maintenance crews. With an average of 72 full time employees and numerous pieces of analytical and facility support equipment, large amounts of energy are consumed each day.</p> <p>It is our environmental responsibility to reduce our energy demands as much as possible while still being able to carry on with day-to-day work activities in safety and comfort. MEL intends to achieve its goal through various efforts, to include but not be limited to (all actions are ongoing unless otherwise noted):</p> <p>Electricity: Electricity is used to light and cool the entire facility and to power the computers, analytical instruments and other equipment contained in the facility. In addition, some of the out buildings are also electrically heated. Occupancy sensors have already been installed on the lights of some of the rooms in the Laboratory. One of the greatest factors in cooling the facility is fume hood operation. In addition, energy-efficient lighting has been installed throughout the Laboratory and Energy Star equipment (such as monitors, computers, refrigerators, freezers, etc.) is being purchased. The 2003 baseline for electricity usage is 130,405 British thermal units per gross square foot (Btu/gsf). The goal for 2006 electricity usage is approximately 127,797 Btu/gsf.</p> <ul style="list-style-type: none"> <li>The SHEMP Manager will continue to monitor the fume hood operation and provide reminders to keep sashes closed. The new wing and part of the west wing of the facility have been equipped with variable air volume (VAV) hoods that greatly reduce</li> </ul>	

the demands on cooling if the sashes are kept closed. The remaining section of the west wing will be equipped with low flow VAV hoods, further reducing the need for electricity for cooling the laboratories.

- The EMS Coordinator and Facility Manager will continue to remind staff to keep doors closed in order to better maintain temperature in individual rooms (e.g. in the wet lab, records management area, etc.).
- The Facility Manager has set thermostats throughout the facility at 68°F and will continue to monitor temperature to ensure energy conservation goals are achieved.
- The Facility Manager will work with the Chemistry Supervisor to investigate the use of air curtains in the walk-in coolers to maximize their energy efficiency. Complete by 2/15/06
- To the extent possible, electrical equipment with the Energy Star rating or FEMP designation will be purchased when replacing or procuring new items (all staff).
- The EMS Coordinator will continue to remind staff to turn off lights, equipment etc. when not needed (e.g. water baths, incubators, etc.)
- The Facility Manager will continue to optimize the Siemens facility monitoring system to help improve energy efficiency.
- The Facility Manager will oversee a contractor study of facility-wide energy use in order to optimize energy efficiency, and reduce the need for equipment replacement and maintenance, as well as power outages. Complete by 4/15/06
- The EMS Coordinator will work with the Regional Pollution Prevention Coordinator to ensure the operation of the Laboratory's solar panels is maximized. Complete by 4/28/06
- The Facility Manager will oversee maintenance of the panels to ensure energy collection is maximized.

**Diesel Fuel:** Diesel is used to fuel the boilers that heat the facility. One of the greatest factors in heating the facility is fume hood operation. The 2003 baseline for diesel fuel usage is 173,094 Btu/gsf. The goal for 2006 diesel fuel usage is approximately 169,632 Btu/gsf.

- The SHEMP Manager will continue to monitor the fume hood operation and provide reminders to keep sashes closed. The new wing and part of the west wing of the facility have been equipped with VAV hoods that greatly reduce the demands on heating if the sashes are kept closed when not in use. The remaining section of the west wing will be equipped with low flow VAV hoods, further reducing the demand on the boilers for heating the laboratories.
- The EMS Coordinator and Facility Manager will continue to remind staff to keep doors closed in order to better maintain temperature in individual rooms (e.g. in the records management area, etc.)
- The Facility Manager will continue to optimize the Siemens facility monitoring system to help improve energy efficiency.

**Propane:** Propane is used to ignite the boilers, fuel the forklift, heat the wet laboratory, and is supplied to various laboratories for an array of uses (i.e. Bunsen burners). The 2003 baseline

for propane usage is 2,151 Btu/gsf. The goal for 2006 propane usage is approximately 2,108 Btu/gsf.

- The Facility Manager will install operational controls to ensure appropriate usage of propane and will monitor usage throughout the year. Complete by 1/31/06
- The Facility Manager will continue to optimize boiler operations to minimize the propane used for ignition.
- The SHEMP Manager will continue to monitor the fume hood operation in the wet lab and remind staff to turn it off when not in use.
- The EMS Coordinator and Facility Manager will continue to remind staff to keep doors closed in the wet lab in order to better maintain temperature in individual rooms.

This list has great potential to expand.

\*The 2% reduction is to affect electricity, diesel and propane as a cumulative total (expressed as Btu's per gross square foot). The total number of Btu's per gross square foot for FY2003 was 305,650.

Executive Orders, Guidelines, and Other Policies:

The Energy Policy Act of 2005 (August 8, 2005), EO13221 section 1; EO13123 sections 205 and 403(b); EO13148 section 201; EO13101 sections 101, 102 and 401.

Specific Legal Requirements:

The Energy Policy Act of 2005 (August 8, 2005)

Structure, Authority, Responsibility-Task(s) and Responsible Person/Group:

1. See above
2. Determine FY2003 consumption for the following (non-field uses of energy):  
electricity, diesel and propane - EMS Coordinator Initiate and complete by 1/15/06.
3. Determine FY2005 consumption (for reference) for the following (non-field uses of energy): electricity, diesel and propane – EMS Coordinator Initiate and complete by 1/31/06

Structure, Authority, Responsibility-Record(s):

1. Electricity purchase records
2. Diesel fuel purchase records
3. Propane purchase records

Responsible Person:

1. Energy Coordinator
2. Facility Manager
3. Facility Manager

Structure, Authority, Responsibility-Document(s):

Responsible Person:

For Competence of Person(s) Responsible and Training, Education, and Experience Requirement see table entitled "Competence Requirements of Specific Positions".

<b>Environmental Management Program #E28A</b>	<b>Earth Day Every Day (ED)</b>
Significant Environmental Aspect(s): Waste generation, vehicle exhaust emissions, stormwater discharge, fuel consumption, water consumption, and noise.	
Objective(s): To make available, activities that promote environmental stewardship for the employees at MEL.	
Target(s): <b>To decrease or mitigate for, through select voluntary efforts, environmental impacts created during a routine work day.</b> Initiate in 2006, then on-going.	
Reason(s) for Significance: Opportunities for pollution prevention, waste reduction, conservation, and environmental stewardship.	
Potential Environmental Impact(s): Environmental contamination, waste generation, use of natural resources.	
Performance Indicator(s) for corresponding targets: <ol style="list-style-type: none"> <li>1. Calculated off-set of carbon emissions.</li> <li>2. Reduction in the amount of lawn area requiring maintenance.</li> <li>3. Calculated amount of biodegradable material diverted from the landfill.</li> <li>4. Number of converted office garbage cans no longer requiring daily plastic bag disposal.</li> </ol>	
Budget and Resources for corresponding targets: EMS Coordinator: 50 hrs Facility Manager: 4 hrs Volunteering lab staff: 5hrs Plant, soil and peat moss purchase: \$300 or less Miniature trash cans: \$75 Vermicomposter bins: \$175	
Program Description: The Earth Day Every Day (ED) EMP is designed to promote environmental stewardship within the employees of MEL. The EMP will be strictly voluntary with an end goal of not only decreasing environmental impacts created during an employees routine work day, but providing staff with some insight into options they have for making an environmental difference at home. Several activities are available; employees choose which they would like to be involved with, if any.  <u>Option 1: Carbon Offsetting*</u> Employees willing to volunteer their time will plant trees on site in an effort to mitigate for carbon emissions released during their commute to and from work. The EMS Coordinator will provide interested staff with the equation necessary to determine their impact. MEL will cover the cost of the trees while employees will cover the labor and necessary tools. Tree	

planting will be done during non-work hours or a Laboratory-sponsored event (i.e. Earth Day), in an area deemed appropriate by the Facility Manager and Lab Director. Watering of the new trees will be necessary during the first year. Any maintenance needed will be performed during non-work hours by volunteers.

\* To the extent budgeted.

#### Option 2: Native Wildflowers

As a means of reducing the square footage of lawn area requiring maintenance, volunteers from MEL will donate their time to spread native wildflower seeds over an area of prepared lawn deemed appropriate by the Facility Manager and Lab Director. MEL will cover the cost associated of seeds. Seed sowing will be done during non-work hours or a Laboratory-sponsored event (i.e. Earth Day). Wildflower plots require little to no maintenance. Any maintenance needed will be performed during non-work hours by willing volunteers.

#### Option 3: Vermicomposting

As a means of preventing the unnecessary land-filling of biodegradable waste generated by staff during work hours, employees will have the opportunity to participate in vermicomposting (the use of worms in composting). Instruction on the appropriate use of vermicomposters will be provided to participating staff by the EMS Coordinator. The employee-run recycling program will split the cost of the vermicomposting bins with facility funds. The number of bins purchased will depend on the number of employees willing to participate/maintain the composters. For CY2006, no more than 2 vermicomposting bins will be purchased using money from the recycling program or facility funds. Compost/worm tea generated in the process will be divided equally between use on the facility as well as personal use by employees participating in the program. See the EMS Coordinator for specifics on the selected vermicomposting system.

#### Option 4: Bag-Free Trash Cans

In an effort to reduce the production and disposal of plastic bags, employees may opt to replace their standard-sized office garbage can with a mini bag-free desktop trash can. By making the switch, an employee is forgoing the need for plastic liners and is limiting the space in which trash can be tossed; ; therefore less room will be available for disposing of otherwise recyclable items. Employees choosing to participate in this option may find it beneficial to participate in vermicomposting as a means of preventing organic waste from entering their un-lined trash can. Large garbage cans located in public areas, such as kitchens and hallways, will still contain the plastic liner for individuals who choose to dispose of organic/wet waste into a trash receptacle.

Executive Orders, Guidelines, and Other Policies:

Executive Order 13101 sections 101, 102, 401, 502(c), and 705. Executive Order 13148 sections 207, 601 and 704. Environmental Policy Act of 2005.

Specific Legal Requirements:

None

Structure, Authority, Responsibility-Task(s) and Responsible Person/Group:

1. Determine carbon off-setting data – EMS Coordinator
2. Organize tree and wildflower planting events for participating staff – EMS Coordinator

3. Purchase vermicomposters, wildflower seeds, and trees – Facility Manager and EMS Coordinator. 4. Provide participating staff with training on the appropriate use of a vermicomposter – EMS Coordinator 5. Purchase mini desktop trash cans – Purchasing Officer 6. Maintain records of pollution prevented/off-set – EMS Coordinator	
Structure, Authority, Responsibility-Record(s): 1. Purchase records  2. Participating staff per option log 3. Carbon-offset log 4. Square footage of lawn replacement  5. Estimated volume of organic waste composted rather than land-filled.	Responsible Person: 1. Purchasing Officer, Facility Manager 2. EMS Coordinator 3. EMS Coordinator 4. Facility Manager EMS Coordinator 5. EMS Coordinator
Structure, Authority, Responsibility-Document(s):	Responsible Person:
For Competence of Person(s) Responsible and Training, Education, and Experience Requirement see table entitled "Competence Requirements of Specific Positions".	





Operational Control # <del>Q22B</del>	Chemical Use
Aspect: Chemical	
Activity Group: Chemical Purchase and Use	
Activities: Preparation and analysis of samples. Calibration and maintenance of laboratory equipment.	
Operational Controls such as technological, operational, procedural (and corresponding written controls, where applicable): <u>Purchasing:</u>  When MEL analysts decide to purchase a chemical, consideration is given to purchasing less toxic alternatives and the smallest reasonable volume that will accomplish the intended purpose. If the chemical has not been purchased before, the analyst seeks approval from the SHEMP Manager or Waste Disposal Officer (WDO) prior to requesting that the Purchasing Officer place the order. This includes chemical purchases made by the WDOE and for ESAT. Approval is usually verbal but can also be represented by initials on a purchase order. As a second check, if the Purchasing Officer has not placed an order for the chemical before, she verifies that the SHEMP Manager or WDO has approved the chemical prior to placing the order. The SHEMP Manager or WDO review every non-routine USEPA and WDOE chemical purchase for quantity and toxicity to ensure that the materials can be safely handled in the facility and that the minimum amounts are purchased.  Team Leaders and Chemistry Supervisors are responsible for ensuring Waste Stream Fact Sheets are completed for all new laboratory waste streams. The WDO uses the Waste Stream Fact Sheets as a final check to determine if any new chemicals are being used without SHEMP Manager or WDO approval.  <u>Management:</u>  A real-time chemical inventory database is maintained electronically (VERTERE).  <u>Safe Handling:</u> Procedures for the safe use of chemicals in the laboratory are documented in the MEL Chemical Hygiene Plan (CHP) and in individual analytical standard operating procedures.  <u>Disposal:</u> Discarded chemicals are characterized by the WDO to determine proper disposal.	
Maintenance plan(s) for the operational controls: 1. SHEMP Manager inspections are used to identify non-conformant areas within the MEL. 2. All relevant policies and procedures are reviewed annually by the SHEMP Manager. 3. The MEL is inspected on a triennial schedule by EPA's Safety, Health and Environmental Management Division (SHEMD).	
Actions to be taken if operational controls fail: 1. SHEMP Manager investigates and reports on inconsistencies, issues, spills, etc. 2. SHEMP Manager develops corrective actions, which can include changes to standard operating procedures, training, etc.	

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3. <u>SHEMP Manager will communicate corrective actions to MEL staff and management and review implementation to ensure effectiveness.</u>	
Record(s):	Responsible Person:
1. <u>Facility chemical inventory</u>	1. <u>SHEMP Manager, WDO, QA Coordinator.</u>
2. <u>Pollution Prevention report to Washington State Department of Ecology on chemical use reduction.</u>	2. <u>SHEMP Manager</u>
3. <u>SHEMD Triennial regulatory compliance reports</u>	3. <u>SHEMP Manager</u>
4. <u>SHEMP Manager annual inspection reports</u>	4. <u>SHEMP Manager</u>
5. <u>Purchase records of chemicals - USEPA</u>	5. <u>USEPA Purchasing Officer</u>
6. <u>Purchase records of chemicals - WDOE</u>	6. <u>WDOE Purchasing Officer</u>
7. <u>8-hour annual safety training content and attendance</u>	7. <u>SHEMP Manager</u>
8. <u>New chemical prior approval records.</u>	8. <u>SHEMP Manager</u>
<b>Responsibilities (to ensure controls are in place; keep controls working; take action when controls fail):</b>	
Title	Responsibility
1. <u>SHEMP Manager</u>	1. <u>Review every non-routine EPA and WDOE chemical purchase for quantity and toxicity. Purchase request is reviewed to ensure that the materials can be safely handled in the facility and that minimum amounts are purchased. Develop and overview staff implementation of policies and procedures for safe storage and use of chemicals, and for responding to spills and other incidents. Periodic inspections conducted to ensure compliance with regulations and procedures.</u>
2. <u>WDO</u>	2. <u>Support SHEMP Manager in the review of every non-routine EPA and WDOE chemical purchase for quantity and toxicity. Support SHEMP Manager in reviewing purchase requests to ensure that the materials can be safely handled in the facility and that minimum amounts are purchased.</u>
3. <u>Laboratory staff</u>	3. <u>Enter each chemical into the VERTERE inventory system soon after its arrival at the Laboratory. Monitor chemical purchase and use in procedures. Store and handle chemicals safely and according to standard operating procedure and CHP. When preparing request for chemical purchase, check inventory to determine if chemical already exists at facility, order minimum amount necessary to perform analytical procedures. Explore means to reduce chemical usage and toxicity in sample analyses and report on these accomplishments.</u>
4. <u>Purchasing Officers</u>	4. <u>Notify SHEMP Manager of new chemical purchases.</u>
For Competence of Person(s) Responsible and Training, Education, and Experience Requirement see table entitled "Competence Requirements of Specific Positions."	

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Operational Control #O26A		Fuel Tank Filling	
Aspect: Contamination of storm water, Soil and Ground water			
Activity Group: Facility Operation and Maintenance			
Activities: Fuel Tank Filling			
Operational Controls such as technological, operational, procedural (and corresponding written controls, where applicable):			
Leaks: A leak detection system is in place to detect a fuel leak from the underground storage tank and is maintained and monitored by the O&M Contractor. The underground storage tank is surrounded by a secondary containment tank that includes a sensor to detect leaks. The piping connected to the underground storage tank is inspected weekly to determine if it is leaking.			
Spills: The fuel vendor is required by law to have and comply with procedures to avoid (and respond to) spills during the refueling procedure.			
Maintenance plan(s) for the operational controls: 1. Maintain and periodically test leak detection system. 2. Periodically review fuel vendor's spill response procedure for adequacy.			
Actions to be taken if operational controls fail: 1. If a significant spill occurs during filling, spill containment measures are undertaken by the fuel delivery personnel and local emergency services (i.e. Fire Department) are called. Depending on the nature of the spill, specific agencies to contact may be the US Coast Guard, USEPA National Response Center, and the WDOE Spill Response Section. Spill clean-up equipment is stored near the filling port. 2. Retraining 3. Evaluate additional controls. 4. Procure or install corrective services or hardware.			
Record(s): 1. Fuel tank pipe and leak detector inspections (in Weekly Technical Report) 2. Fuel oil delivery vendors' procedure(s) for safe delivery of fuel oil 3. Records of spills or underground storage tank leaks to the containment tank		Responsible Person: 1. O&M Contractor 2. Facility Manager 3. Facility Manager	
Responsibilities: (to ensure controls are in place; keep controls working; take action when controls fail; create and keep records relative to operational controls):			
Title		Responsibility	
1. Facility Manager		1. Maintain Weekly Technical Reports and fuel vendor's emergency response plan. Oversight of O&M contractor.	
2. Fuel delivery vendor		2. Ensure fuel transfer controls are in place and working. Initiate corrective actions in case of a spill during tank filling.	

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3. O&M Contractor	3. Underground storage tank pipe inspections, facilitate fuel delivery, maintain and monitor leak detector and generate associated records	Deleted: 2
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Operational Control #O27B	<b>Hazardous Waste</b>
Aspect: Hazardous Waste Disposal	
Activity Group: Disposal of hazardous waste materials from laboratory analyses	
Activities: Analytical activities Solvent use Sample and sample container disposal Calibration and maintenance of laboratory equipment Changing oil in pumps Facility operation and maintenance Sample collection in field	
Operational Controls such as technological, operational, procedural (and corresponding written controls, where applicable): The Laboratory's hazardous waste management and safety programs involve:  <u>General:</u> Characterization of all re-occurring waste streams to determine if they will be classified as a hazardous waste. Waste stream characterizations are recorded on waste profile sheets.  Locking the 180-day hazardous waste accumulation areas to prevent unauthorized addition/removal of materials.  Thorough documentation of all waste shipped off-site to ensure "cradle-to-grave" tracking.  Control of purchasing chemicals through implementation of the Chemical Hygiene Plan.  Annual internal inspections by the Laboratory Health and Safety Committee.  Triennial external inspections by EPA's Safety, Health, and Environmental Management Division (SHEMD).  <u>Sample Waste:</u> Minimizing the sample volume disposed of as hazardous waste by specifying the sample quantities to be taken in the analytical standard operating procedure (SOP) and Quality Assurance Project Plan (QAPP).  Approval by the Waste Disposal Officer (WDO) of all samples for disposal. The WDO indicates which samples are to be designated as hazardous and must be disposed of as hazardous waste.  <u>Container Management:</u> Weekly inspections of the central waste accumulation areas.	

**Deleted:** Purchase of chemicals is controlled.¶  
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Dating of waste containers moved to the central accumulation area to ensure off-site removal within 180 days.	
Secondary containment in both the satellite and central waste accumulation areas.	
Labeling of containers as “hazardous waste”, the contents described and the major hazard(s) indicated by decals.	
Use of appropriate containers to store liquid waste to reduce breakage.	
Maintenance plan(s) for the operational controls:	
<ol style="list-style-type: none"> <li>1. Periodically train staff on proper procedures and regulations for hazardous waste disposal.</li> <li>2. An exception report is created if signed hazardous waste manifests are not returned within 45 days. 80% of the payment to the waste broker is withheld pending receipt of all Certificates of Disposal (CDs).</li> </ol>	
Actions to be taken if operational controls fail:	
<ol style="list-style-type: none"> <li>1. Investigate and install additional controls.</li> <li>2. The SHEMP Manager directs corrective actions and policy changes through the Health and Safety Committee and organizational management components.</li> <li>3. Communicate to affected MEL staff and retrain as necessary.</li> </ol>	
Record(s):	Responsible Person:
<ol style="list-style-type: none"> <li>1. Hazardous waste disposal records</li> <li>2. Accumulation area log sheets</li> <li>3. Safety and health audit</li> <li>4. Waste profile sheets</li> <li>5. Records of chemical purchases</li> </ol>	<ol style="list-style-type: none"> <li>1. WDO</li> <li>2. WDO</li> <li>3. SHEMP Manager</li> <li>4. WDO</li> <li>5. WDOE Purchasing Officer USEPA Purchasing Officer</li> </ol>
<b>Responsibilities (to ensure controls are in place; keep controls working; take action when controls fail):</b>	
Title	Responsibility
1. WDO	1. Ensure controls for hazardous waste management are in place and working. Maintain hazardous waste disposal, waste accumulation area, and waste profile records. Investigate and initiate corrective actions when controls fail.
2. SHEMP Manager	2. Ensure controls are in place and working for the purchase and environmentally responsible and safe use of hazardous materials. Maintain annual and triennial SHEM audit records and chemical inventory. Investigate and initiate corrective actions when controls on chemical inventory system or SHEM program fail.
3. Laboratory staff	3. Follow all applicable controls, procedures and practices for handling and disposing of hazardous wastes.

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MEL is a consolidated facility housing offices and extensive chemical and microbiological laboratories for three different organizations. The office activities result in the generation of non-hazardous solid wastes, while the laboratory and facility activities result in the generation of diverse chemical and microbiological wastes of varying quantities and toxicities, as well as additional non-hazardous solid wastes. ¶

¶ MEL is classified as a medium quantity hazardous waste generator by the State of Washington. As such, the facility is allowed to accumulate hazardous waste on-site for no more than 180 days and must generate less than 1 kg of acutely hazardous waste and less than 1000 kg of hazardous waste per month. MEL's SHEMP Manager and Waste Disposal Officer (WDO) develop facility-wide policies and procedures that are in accordance with all Federal, State, and County requirements for all aspects of waste generation, storage and disposal. Most non-hazardous wastes and all non-recyclable, standard solid wastes are removed from the facility by a contract waste hauler under the supervision of the Facility Manager.¶

¶ MEL has one USEPA RCRA Generator Identification Number (WA8680030931). The facility has two closely located 180-day hazardous waste storage areas. Both of these 180-day hazardous waste storage areas have their access restricted to the WDO, selected organizational Waste Coordinators, the MEL Facility Manager and the EPA Laboratory Director. Hazardous waste removal from MEL typically occurs every 4-5 months by a contract hazardous waste hauler under the supervision of the WDO.¶

¶ One of MEL's environmental goals is to reduce the volume of hazardous waste generated by facility operations. By achieving the Chemical Resources Environmental Management Program (EMP) targets of reducing the amount of toxic chemicals, the volume of solvents, and the total volume of chemicals used in analytical tests, MEL will achieve reductions in the volume of hazardous waste generated by the facility. Eliminating the use of mercury-containing fluorescent bulbs (Electricity EMP), CFC-containing equipment (Air Emissions EMP), and radioactive source equipment (Radiation EMP) will further achievement of this goal.¶

¶ MEL also has a goal to reduce the amount of non-hazardous waste the facility [119]

4. Hazardous Waste Contractor	4. Package, transport and dispose of hazardous wastes in accordance with the contract specifications and applicable regulations
For Competence of Person(s) Responsible and Training, Education, and Experience Requirement see table entitled "Competence Requirements of Specific Positions".	



Operational Control # <u>O21A</u>	<b><u>Ozone-Depleting Substances (ODS)</u></b>
Aspect: Air Emissions	
Activity Group: <u>Equipment</u> Operation and Maintenance	
Activities: <u>Cooling equipment</u> maintenance	
Operational Controls such as technological, operational, procedural (and corresponding written controls, where applicable): <u>As equipment requires replacement, the MEL replaces all ODS Class I containing appliances, such as chillers, refrigerators and freezers, with equipment containing non-ODS Class I refrigerants. The Facility Manager, with assistance from the USEPA Purchasing Officer and WDOE Purchasing Coordinator, maintains a list of appliances identified by refrigerant type.</u>	
<u>For existing ODS-containing equipment at the MEL, the O&amp;M Contractor performs maintenance and conducts inspections to ensure that it complies with applicable regulations.</u>	
<u>The Facility Manager is notified of completion of preventive maintenance in the Weekly Technical Report.</u>	
Maintenance plan(s) for the operational controls: <u>1. The O&amp;M contractor performs weekly and monthly inspections. The inspections include checking components for leaks, such as checking for oil around fittings of ODS -containing equipment.</u> <u>2. The O&amp;M contractor performs preventative maintenance as required.</u>	
Actions to be taken if operational controls fail: <u>1. Secure all detected leaks.</u> <u>2. Replace failed equipment with non-ODS containing appliance.</u>	
Record(s): <u>1. Weekly Technical Report</u> <u>2. List of appliances identified by refrigerant type.</u> <u>3. Purchase records for refrigerators and freezers</u>	Responsible Person: <u>1. Facility Manager</u> <u>2. Facility Manager</u> <u>3. USEPA Purchasing Officer,</u> <u>WDOE Purchasing Coordinator,</u>
<b><u>Responsibilities (to ensure controls are in place; keep controls working; take action when controls fail):</u></b>	
<b><u>Title</u></b>	<b><u>Responsibility</u></b>
<u>1. Facility Manager</u>	<u>1. Oversight of O&amp;M Contractor. Maintain records of appliances containing ODS and Weekly Technical Reports.</u>
<u>2. O&amp;M Contractor</u>	<u>2. Ensure controls are in place and working. Equipment inspections and surveys and associated records. Preventive maintenance. Investigate and initiate corrective actions when controls fail.</u>
For Competence of Person(s) Responsible and Training, Education, and Experience Requirement see table entitled "Competence Requirements of Specific Positions."	

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Operational Control # <u>O30B</u>	<b>Paper</b>	Deleted: A
Aspect: Paper Consumption		Deleted: 9
Activity Group: Facility Operation and Maintenance		Deleted: Consumption
Activities: Printer, copier, and fax use of paper		Deleted:
<u>Operational Controls such as technological, operational, procedural (and corresponding written controls, where applicable):</u> <u>WDOE purchases the printer and copier paper in use within the main building and satellite lab areas on site. WDOE Laboratory management has implemented Washington State Executive Order 02-03, "Sustainable Practices by State Agencies", by establishing a procurement policy that requires printer and copy paper to contain 100% post-consumer recycled content and be manufactured with a chlorine-free process. This also meets the recycled paper requirements in US Executive Order 13148. EPA is mandated by EO 13148 to purchase office paper products with a minimum of 30% post-consumer recycled content. Office paper purchased by MEL contains a minimum of 30%. When feasible, this percentage is increased.</u>		Deleted: at MEL
<u>A large percentage of MEL's paper usage is for analytical data reporting. One of the largest usage areas is lab-wide final data reports. To minimize paper consumption, MEL creates electronic data reports wherever possible.</u>		Deleted: reduce
<u>Information technology staff ensure that all desktop personal computers and printers are set to default to duplex. A checklist is used to ensure all computers and printers are included.</u>		Deleted: To minimize paper use, laboratory staff are actively encouraged via emails, posted signs and meeting
<u>To minimize paper use, laboratory staff are actively encouraged to reduce paper consumption in all aspects of their daily activities such as by using electronic files rather than print-outs, using double-sided copies or miniaturizing printouts. Printers and copiers are maintained in good working order to reduce wasted copies.</u>		Deleted: s
<u>The Recycling Coordinator will calculate and report annually the percent reduction of paper usage relative to the three base years of 2000 - 2002 using the following equation:</u>		Deleted: announcements to reduce paper consumption in all aspects of their daily activities such as by using electronic files rather than print-outs, using double-sided copies or miniaturizing printouts. Printers and copiers are maintained in good working order to reduce wasted copies. ¶
<u>Current paper consumption:</u> <u>Number of boxes of paper used in 2006, divided by Number of MEL FTE* in 2006</u>		Deleted: 1998 -
<u>Base paper consumption:</u> <u>Annual number of boxes of printer paper used by MEL FTE* (average of three years, 2000 - 2002) divided by annual number of MEL FTE* (average of three years, 2000 - 2002)</u>		Deleted: printer
<u>*The number of FTE includes laboratory staff of EPA, WDOE and the analytical and data entry staff of ESAT. ESAT's non-analytical and IT staff receive their paper from a separate source, as do EPA's field staff. Use of a three-year average for the paper consumption</u>		Deleted: 5
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baseline will dampen the effect of unusual annual paper consumption values and mitigate any issues presented by paper purchased in one year but used in the next.

**Maintenance plan(s) for the operational controls:**

1. The IT staff use an annual checklist to ensure that all PCs and printers are defaulting to duplex printing. Printers and copiers are maintained in good working order to reduce wasted copies.
2. The Recycling Coordinator periodically checks to confirm that printer and copier paper meet WDOE specifications.
3. The Recycling Coordinator will annually review and report on the amount of paper used per FTE and communicate to staff regarding the Laboratory's progress in reducing paper consumption.

**Actions to be taken if operational controls fail:**

1. Retrain laboratory staff.
2. Implement an EMP to address areas of concern.

**Record(s):**

1. Paper purchasing records
2. Duplex printing checklist
3. Reminders on copiers to duplex
4. Email reminders to staff on minimizing paper use (e.g. double-sided copies, reviewing electronic versions)
5. Annual paper use/FTE report

**Person Responsible:**

1. WDOE Purchasing Officer
2. IT Staff
3. Office Managers
4. Recycling Coordinator
5. Recycling Coordinator

**Responsibilities: (to ensure controls are in place; keep controls working; take action when controls fail):**

Title	Responsibility
1. Data Entry Technicians	1. Maintain relevant records. Follow procedures for creating final reports.
2. Laboratory Director	2. Reconfirm and report on achievement of paper use reduction goals.
3. IT Staff	3. Ensure printing controls are in place and working. Investigate and initiate corrective action. Maintain annual checklist of computers and printers set to default to duplex printing.
4. Laboratory Staff	4. Follow applicable operational controls and procedures for double-sided printing and minimizing paper use.
5. Recycling Coordinator	5. Ensure overall paper use reduction controls are in place and working. Investigate and initiate corrective action. Occasional inspection of paper recycling receptacles for single-sided copies. Calculate and report paper consumption.
6. WDOE Purchasing Officer	6. Document the number of boxes of printer paper purchased for each year from 2000 to current.
7. USEPA Office Manager	7. Document the number of FTE using the MEL's facilities each year from 2000 to current.

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<del>8. WDOE Office Manager</del>	<del>8. Document the number of FTE using the MEL's facilities each year from 2000 to current.</del>	Deleted: 10
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Operational Control #O32B	<b>Solid Waste Generation</b>
Aspect: Waste Generation	
Activity Group: All laboratory and office activities	
Activities: Employee generation of solid waste including aluminum, scrap metal, glass food/beverage containers, plastic containers #1 through #6, mixed paper, cardboard, various types of plastic bags, bubble wrap, DVDs, CDs, jewel cases, diskettes, toner cartridges, ink jet cartridges, audio and video tapes, household batteries, marine/auto batteries, rechargeable batteries, mercury batteries, cell phones, Tyvek envelopes, pallets, packing peanuts, safety glasses (and others), and non-recyclable solids.	
Operational Controls such as technological, operational, procedural (and corresponding written controls, where applicable): The MEL has an established recycling program to recycle everything for which a vendor is reasonably available. The program currently uses Waste Management Inc. (WM) to remove and recycle every two weeks: tin/steel cans, glass food/beverage containers, plastic containers, #1 through #6, mixed paper, and cardboard. Volunteers transport household, marine and auto batteries to a local transfer station or private recycler and mercury batteries to Kitsap County's Moderate Risk Waste Facility. Rechargeable batteries are mailed to the Rechargeable Battery Recycling Corporation in shipping containers provided by the company. Volunteers transport plastic bags to local grocery stores or thrift stores. Working cell phones are donated to a local charity and non-functioning cell phones are recycled with the rechargeable batteries. Tyvek envelopes are recycled by mailing them to the Dupont Corporation or a local recycler. Packing peanuts are either reused by laboratory employees or transported by volunteers to local packing stores for reuse. Shredded paper is either re-used by laboratory employees or transported to a local composter. DVDs, CDs, jewel cases, diskettes, ink jet cartridges, and audio and video tapes are sent to Green Disk or a local recycler. Pallets are reused by the O&M contractor. Aluminum cans, aluminum containers, aluminum foil, and scrap metal are taken to a local recycler. Eye glasses (to include safety glasses, sun glasses and hearing aids) are taken by a volunteer to a Goodwill Industries store where they are collected for the Lions Club eye glass reuse program. The remaining non-recyclable, non-hazardous solids are picked up weekly by Waste Management for landfill disposal.	
The Recycling Coordinator maintains and updates, as needed, the MEL's recycling program by organizing volunteers, hauling away certain recyclable materials to local recyclers, placing and maintaining clearly labeled containers for each group of recyclable material throughout the Laboratory and office buildings, performing occasional inspections of recyclable waste accumulation areas, recording volumes and weights of recyclables, keeping staff informed, and advising staff of deviations from the established recycling procedures.	
The Recycling Coordinator also leads the MEL Recycling Rewards Program. Rewards consist of "Manchester Bucks" which are awarded to MEL employees who volunteer to assist the	

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<p><u>recycling program, for personnel who create innovative approaches to decreasing the lab's solid waste generation, and for those who participate in other Laboratory-sponsored environmental events such as Earth Day. Staff redeems "Manchester Bucks" during Recycling Rewards Program activities.</u></p>	
<p>Maintenance plan(s) for the operational controls:</p> <ol style="list-style-type: none"> <li>1. Review procedures periodically.</li> <li>2. Review of inspection reports/notes.</li> <li>3. Review training records periodically.</li> <li>4. <u>Annual Laboratory-wide Recycling Program training.</u></li> </ol>	
<p>Actions to be taken if operational controls fail:</p> <ol style="list-style-type: none"> <li>1. <u>Recycling Coordinator develops and implements corrective actions.</u></li> <li>2. <u>Appropriate communications to MEL staff and management are issued as needed to address root issues.</u></li> <li>3. <u>Provide additional training as needed.</u></li> </ol>	
Record(s):	Responsible Person:
1. Documentation of training sessions, award program.	1. Recycling Coordinator
2. Scrap metal and aluminum recycling receipts.	2. Recycling Coordinator
3. <u>Recycled material measurement records</u>	3. Recycling Coordinator
4. <u>Notes of inspection findings</u>	4. <u>Recycling Coordinator</u>
5. <u>Recycled material measurements for items not delivered or mailed to a recycler on a monthly basis.</u>	5. <u>Recycling Coordinator</u>
<p><b><u>Responsibilities (to ensure controls are in place; keep controls working; take action when controls fail):</u></b></p>	
Title	Responsibility
1. <u>Recycling Coordinator</u>	<p><u>1. Recycling Program oversight. Label, place and monitor on-site collection bins for recyclable materials. Email staff and provide staff meetings with information about the environmental impacts of waste generation. Keep up-to-date with local recycler markets and recycling trends in order to increase the number of waste streams recycled. Provide annual recycling training and monitor attendance. Remove from bins recycled materials not accepted by WM contract. Monitor WM pickup of recycling totes. Recycling Rewards Program oversight.</u></p>
2. <u>WDO</u>	<p><u>2. Compliance with disposal regulations for mercury-containing bulbs.</u></p>
<p>For Competence of Person(s) Responsible and Training, Education, and Experience Requirement see table entitled "Competence Requirements of Specific Positions".</p>	

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Operational Control #O33B	Wastewater
Aspect: Waste water	
Activity Group: Facility operation and maintenance	
Activities: Use of dishwashers Sample analysis, chemical use and disposal	
Operational Controls such as technological, operational, procedural (and corresponding written controls, where applicable): MEL sink waste water is discharged into an elementary neutralization unit. This unit continuously monitors the pH of the effluent and adds acid or base accordingly to keep the discharge to the Publicly Owned Treatment Works between pH 6 and 9. A strip chart recorder records pH.  MEL has a written agreement with Washington State and Kitsap County. This agreement stipulates that MEL will not discharge more than 30 gallons per day of 3% methylene chloride. Annually, the Laboratory reports its daily discharge amounts to the Publicly Owned Treatment Works.  All new laboratory waste streams are documented and a determination is made as to whether to allow sink discharge of each waste stream based on this information.  MEL staff receive annual Laboratory Safety and Health training to remind them of proper wastewater disposal practices.	
Maintenance plan(s) for the operational controls: 1. The strip chart recorder is monitored weekly to ensure it is properly working. The pH probes are cleaned once a week and calibrated once a month. The calibrations are indicated on a log sheet. 2. A daily log is kept by the organics extraction group to ensure compliance with the discharge limit of ≤ 30 gallons per day of 3% methylene chloride. 3. Laboratory staff are informed of the MEL wastewater policies and procedures and are expected to comply with existing controls as documented in the Waste Disposal Manual and in SOPs for using laboratory equipment.	
Actions to be taken if operational controls fail: If the wastewater pH is outside the range 6 to 9 pH for more than 10 minutes, an audible and visible alarm sounds outside of the building and the WDO responds to investigate and perform corrective actions.	
Record(s): 1. Safety and health audit 2. pH probe log sheets 3. pH strip chart recordings 4. Methylene chloride discharge log 5. Annual daily-discharge report	Responsible Person: 1. SHEMP Manager 2. WDO 3. WDO 4. SHEMP Manager 5. Organics Staff



<b>Responsibilities (to ensure controls are in place; keep controls working; take action when controls fail):</b>	
Title	Responsibility
1. Waste Disposal Officer	1. Designation of sample waste as hazardous or not. Proper operation and maintenance of the laboratory wastewater neutralization unit (pH probes and chemicals). Analyze pH monitoring data for compliance with pretreatment limits. Communicate policies and procedures to Laboratory staff. Conduct periodic inspections/ audits.
2. Facility Manager	2. O&M Contractor oversight.
3. Laboratory staff	3. Compliance with existing controls as documented in the CHP, and SOPs for using lab equipment
4. SHEMP Manager	4. Communicate requirements contained in the CHP. Conduct inspections/audits. Maintain wastewater program, policies, and procedures including the CHP.
5. O&M Contractor	5. Maintenance and repair of the laboratory wastewater neutralization unit (building, plumbing, equipment).
For Competence of Person(s) Responsible and Training, Education, and Experience Requirement see table entitled "Competence Requirements of Specific Positions."	



5. Microbiology Staff	5. Keep autoclaves in stand-by when not actively in use
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## Competence Requirements of Specific Positions

Position Title:	Training/Education/Experience Requirements
EMS Coordinator	On-the-job training and experience in chemical management and lab operations, EMS training, familiarity with MEL's EMS, familiarity with executive orders.
Recycling Coordinator	On-the-job training and experience in chemical management and lab operations, EMS training, familiarity with executive orders, local recycling regulations, and Kitsap County's Solid Waste Advisory Committee membership.
SHEMP Manager (Safety, Health, and Environmental Management Program)	Factors in Position Description include supervisory controls, guidelines, training, complexity, scope and effect, personal contacts, purpose of contacts, physical demands and work environment. On the job training, facility management courses, experience, contracting/project officer training, attendance at annual national EPA SHEMP conferences, networking with other SHEMP Managers, CFR updates, USEPA headquarters updates and correspondences, USEPA and private regulatory publications, regulatory E-mail updates, detailed knowledge of MEL's CHP, and regulatory requirements associated with wastewater discharge, experience in laboratory operations, experience with construction and operating contracts.
WDO (Waste Disposal Officer)	Factors in Position Description include supervisory controls, guidelines, training, complexity, scope and effect, personal contacts, purpose of contacts, physical demands and work environment. On the job training, ability to test, calibrate and install hardware and software for power monitoring and interpret results, familiarity with laboratory information technology, 8 hour annual safety training or on the job training and experience in chemical management and lab operations. Familiarity with chemical hazards and waste management, familiarity with relevant RCRA and TSCA waste regulations.
Facility Manager	Factors in Position Description include supervisory controls, guidelines, complexity, scope and effect, personal contacts, purpose of contacts, physical demands and work environment. Familiarity with electrical equipment in facility, ability to interpret power consumption results. On-the-job training, facility management courses, experience, contracting/project officer training, networking with other Facility Managers, CFR updates; USEPA headquarters updates and correspondences, regulatory E-mail updates. Experience operating laboratories. Experience with construction and operating contracts as Project Officer. Conversant regarding technology.
O&M Contractor (Operations and Maintenance)	Factors in Contract SOW describe knowledge required by the position, supervisory controls, guidelines, complexity, scope and effect, personal contacts, purpose of contacts, physical demands and work environment.
Purchasing Officer	Factors in Position Description include supervisory controls, guidelines, complexity, scope and effect, personal contacts, purpose of contacts, physical demands and work environment. USEPA purchasing training.

Energy Coordinator	Factors in Position Description include supervisory controls, guidelines, complexity, scope and effect, personal contacts, purpose of contacts, physical demands and work environment. Purchasing training, experience with tracking and budget, on-the-job training.
Lab Managers	Factors in Position Description include supervisory controls, guidelines, complexity, scope and effect, personal contacts, purpose of contacts, physical demands and work environment. Experience with tracking and budget, on-the-job training, experience in laboratory operations, management skills.
RSO (Radiation Safety Officer)	Certified 40 hour Radiation Safety Officer Course. Education and experience to qualify for position; on-the-job training for using instruments that have radioactive components or sources.
XRF operator	On-the-job training for using counting equipment and sample handling, familiarity with using Innovis or Niton XRF instruments, MEL Radiation Safety training.
ESAT Sample Custodian	8 hour annual safety training, familiarity with waste disposal procedures, familiarity with laboratory information technology, training for sample radiation screening, familiarity with archival of data procedures.
Waste Coordinator	Familiarity with chemical hazards and waste management, familiarity with relevant RCRA and TSCA waste regulations, 8 hour annual safety training.
MEL staff (EPA, ESAT, BCS, Ecology)	8 hour annual safety training, on the job experience, experience in chemical management and lab operations, annual EMS training, annual recycling program refresher training, updates to improvements/changes within the recycling program. Familiarity with policies regarding use of sinks for disposal of spent samples, laboratory reagents, etc. Staff that operate autoclaves, dishwashers and the DI water system are familiar with the operating procedures for procedures for the efficient use of deionizing water systems, autoclaves and dishwashers.
Janitorial contract staff	On the job training and guidance from janitorial contractor and Facility Manager.

## **Legal Requirements and Executive Orders Applicable to MEL Facility and Activities**

### **Air Emissions:**

#### **Executive Orders and Other Policies:**

Executive Order 13148, Greening of the Government Through Leadership in Environmental Management:

Sections 206, 703. Reductions in Ozone-depleting Substances. Each agency shall develop a plan to phase-out the procurement of Class I Ozone-depleting substances; maximize use of safe alternatives; phase-out Class I Ozone-depleting substance applications; preclude disposal of ozone-depleting substances removed or reclaimed from its facilities or equipment.

Section 505. Reductions in Ozone-depleting Substances. To attain the goals of section 206 of this order, each agency shall ensure that its facilities maximize the use of safe alternatives to ozone depleting substances; evaluate the present and future uses of ozone depleting substances; and develop a plan to phase-out the procurement of Class I ozone depleting substances for all non-excepted uses by December 31, 2010.

#### **Specific Legal Requirements:**

40 CFR Part 68, Subpart F, Regulated Substances for Accidental Releases, under CAA Section 112(r): Regulated toxic and flammable substances and threshold quantities required under section 112(r) of the CAA are listed in Tables 1, 2, 3, and 4 of 40 CFR 68.130.

40 CFR Part 60, Subpart D, Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units.

40 CFR Part 82, Subpart F, under authority of CAA, Recycling and Emissions Reduction: Maintain, service, repair, and dispose of appliances without releasing Class I or Class II substances used as a refrigerant.

WAC 173-303-506 Requirements for Recycling CFC.

WAC 173-470 Particulate Emissions: Regulates particulate emissions.

WAC 173-401-533. Control of Sulfur Oxides Emissions from Fuel Burning Equipment: Limits the sulfur content of oil to 0.1% by weight.

WAC 173-490-025 : (4) Sources of volatile organic compound (VOC) emissions may be exempted, by the director, from any or all requirements to control or reduce the emissions of VOCs when: (a) The source is a development operation and the equipment is used exclusively for research, laboratory analysis or determination of product quality and commercial acceptance, provided emissions of VOCs from such operations do not exceed 300 kg (660 lbs) per month.

## **Chemical Resources (Purchase, storage, handling, use):**

### **Executive Orders and Other Policies:**

Executive Order 13101, Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition:

Section 101, 102, 401. Prevent pollution whenever feasible; acquire environmentally preferable products. Consider the following factors in acquisition planning: use of bio-based products; use of recovered materials; reuse of product; life cycle cost; recyclability; use of environmentally preferable products; waste prevention (including toxicity reduction or elimination); and ultimate disposal.

Section 402. Develop and implement affirmative procurement programs

Section 403. Federal facility compliance. EPA or authorized States inspect federal facilities to evaluate compliance with section 6002 of RCRA and report annually to the Federal Environmental Executive

Executive Order 13148, Greening of the Government Through Leadership in Environmental Management, Sections 204, 205, 206, 305, 307, 402, 501, 502, 503, 505, 701, 703:

Section 204. Release Reduction: Toxic Chemicals. Each agency shall reduce its reported Toxic Release Inventory (TRI) releases and off site transfers of toxic chemicals for treatment and disposal by 10 percent annually, or by 40 percent overall by December 31, 2006.

Section 205. Use Reduction: Toxic Chemicals and Hazardous Substances and Other Pollutants. Each agency shall reduce its use of selected toxic chemicals, hazardous substances, and pollutants, or its generation of hazardous and radioactive waste types at its facilities by 50 percent by December 31, 2006.

Section 206. Reductions in Ozone Depleting Substances. Each agency shall develop a plan to phase out the procurement of Class I Ozone-depleting substances for all non-excepted uses by December 31, 2010.

Section 305 (b). Policies, Strategies, and Plans. By March 31, 2002, each agency shall ensure that its facilities develop a written plan that sets forth the facility's contribution to the goals and requirements established in this order. The plan should reflect the size and complexity of the facility. Where pollution prevention plans or other formal environmental planning instruments have been prepared for agency facilities, an agency may elect to update those plans to meet the requirements and goals of this section.

Section 307. Annual Reports. Each agency shall submit an annual progress report to the Administrator on implementation of this order. The reports shall include a description of the progress that the agency has made in complying with all aspects of this order, including, but not limited to, progress in achieving the reduction goals in sections 502, 503, and 505 of this order.

Section 402. Facility Compliance Audits. Within 12 months of the date of this order, each agency with an established regulatory environmental compliance audit program may elect to conduct EMS audits in lieu of regulatory compliance audits at selected facilities within 6 months of development of the EMS program.

Section 501. Toxics Release Inventory/Pollution Prevention Act Reporting. Each agency shall comply with the provisions set forth in section 313 of EPCRA, section

6607 of Pollution Prevention Act, all implementing regulations, and future amendments to these authorities, in light of applicable EPA guidance.

Section 502. Release Reduction: Toxic Chemicals. Beginning with reporting for calendar year 2001 activities, each agency reporting under section 501 of this order shall adopt a goal of reducing, where cost effective, the agency's total releases of toxic chemicals to the environment and off site transfers of such chemicals for treatment and disposal by at least 10 percent annually, or by 40 percent overall by December 31, 2006.

Section 503. Use Reduction: Toxic Chemicals, Hazardous Substances, and Other Pollutants. To attain the goals of section 205 of this order: (a) Within 18 months of the date of this order, each agency with facilities shall develop and support goals to reduce the use at such agency's facilities of the priority chemicals on the list under subsection (b) of this section for identified applications and purposes, or alternative chemicals and pollutants the agency identifies under subsection (c) of this section, by at least 50 percent by December 31, 2006.

Section 505. Reductions in Ozone Depleting Substances. To attain the goals of section 206 of this order: (a) Each agency shall ensure that its facilities: (1) maximize the use of safe alternatives to ozone depleting substances... (2) evaluate the present and future uses of ozone depleting substances... (b) ...each agency shall develop a plan to phase out the procurement of Class I ozone depleting substances for all non-excepted uses by December 31, 2010.

Section 701. Limiting Procurement of Toxic Chemicals, Hazardous Substances, and Other Pollutants. (a) Each agency shall implement training programs to ensure that agency procurement officials and acquisition program managers are aware of the requirements of this order. (b) Each agency shall determine the feasibility of implementing centralized procurement and distribution (e.g., pharmacy) programs at its facilities. (d) Each agency shall follow the policies and procedures for toxic chemical release reporting in accordance with FAR section 23.9 effective as of the date of this order and policies and procedures on Federal compliance with right to know laws and pollution prevention requirements in accordance with FAR section 23.10.

Section 703. Ozone Depleting Substances. Each agency shall follow the policies and procedures for the acquisition of items that contain, use, or are manufactured with ozone depleting substances in accordance with FAR section 23.8 and other applicable FAR provisions.

Specific Legal Requirements:

40 CFR Part 68, Subpart F, Regulated Substances for Accidental Releases (under CAA section 112(r)). Regulated toxic and flammable substances and threshold quantities required under section 112(r) of the CAA are listed in Tables 1, 2, 3, and 4 of 40 CFR 68.130.

40 CFR Part 247, Comprehensive Procurement Guidelines for Products Containing Recycled Materials (helps MEL comply with EO 13101). Federal agencies must purchase recycled-content products. Designated products are listed at [www.epa.gov/cpg](http://www.epa.gov/cpg).

40 CFR Part 302, Designation, Reportable Quantities, and Notification (under CERCLA



section 102(a)):

302.4 Designation of Hazardous Substances.

302.5 Determination of Reportable Quantities

302.6 Notification Requirements

40 CFR Part 355, Emergency Release Notification (under EPCRA section 304).

Mandates that notice of releases of CERCLA hazardous substances and EHSs be given immediately to SERCs and LEPCs for the areas likely to be affected by the release, 355.40 Emergency Release Notification

40 CFR Part 370, Hazardous Chemical Reporting: Community Right-to-Know (under EPCRA sections 311 and 312). Facility must provide information on hazardous chemicals to emergency planners and the public on the hazards those chemicals pose and the site-specific details on how they are handled by facilities. (Diesel is the only chemical stored on the MEL site above the reporting threshold.):

370.20 Threshold quantities for extremely hazardous substances, gasoline, heating oil number 2.

370.21 MSDS Reporting

370.25 Inventory Reporting

40 CFR Part 372, Toxic Chemical Release Reporting: Community Right-to-Know (under EPCRA section 313). Facilities must report to EPA and the appropriate state agency their releases and off-site transfers of listed chemicals if the facility exceeds specified thresholds for manufacturing, processing or otherwise use of the chemical:

372.10 and 372.30 Recordkeeping and Reporting

372.22 Covered Facilities for Toxic Chemical Release Reporting

372.25 Thresholds for Reporting

372.28 Lower Thresholds for Chemicals of Concern (PBTs)

372.65 Chemicals and Chemical Categories

40 CFR Part 156, Labeling Requirements for Pesticides and Devices, 156.10.

Labeling requirements

29 CFR, Part 1910, Occupational Safety and Health Standards, Subpart Z, Toxic and Hazardous Substances (table of contents lists substances for which there are standards):

1910.1048 Formaldehyde Standard (exposure limit, exposure monitoring, and regulated areas)

1910.1052 Methylene Chloride Standard (exposure limit, exposure monitoring, and regulated areas)

1910.1200 Hazard Communication (evaluate hazards of all chemicals, transmit hazard information to employers and employees by means of comprehensive hazard communication programs, which are to include container labeling and other forms of warning, material safety data sheets and employee training)

1910.1450 Occupational Exposure to Hazardous Chemicals in Laboratories (exposure limit, exposure monitoring, chemical hygiene plan, training, etc.)



## Electricity Consumption:

Executive Orders and Other Policies:

Executive Order 13221, Energy Efficient Standby Power Devices:

Section 1. Energy-Efficient Standby Power Devices. Each agency, when it purchases commercially available, off the shelf products that use external standby power devices, or that contain an internal standby power function, shall purchase products that use no more than one watt in their standby power consuming mode. If such products are not available, agencies shall purchase products with the lowest standby power wattage while in their standby power consuming mode.

Executive Order 13123, Greening the Government Through Energy Efficient Management (sets goals for the Agency):

Section 403(b). Energy Star and Other Energy Efficient Products. Agencies shall select, where life-cycle cost-effective, Energy Star and other energy efficient products when acquiring energy-using products.

Executive Order 13148, Greening of the Government Through Leadership in Environmental Management:

Section 201. Environmental Management. Through development and implementation of environmental management systems, each agency shall ensure that strategies are established to support environmental leadership programs, policies, and procedures and that agency senior level managers explicitly and actively endorse these strategies.

Energy Policy Act of 2005: Reduce FY06 energy usage by 2% over base year FY03.

Specific Legal Requirements:

None

## **Fuel Consumption (Heating Oil and Gasoline):**

Executive Orders and Other Policies:

Executive Order 13101, Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition:

Section 101, 102, 401. Prevent pollution whenever feasible; acquire environmentally preferable products. Consider the following factors in acquisition planning: use of bio-based products; use of recovered materials; reuse of product; life cycle cost; recyclability; use of environmentally preferable products; waste prevention (including toxicity reduction or elimination); and ultimate disposal. Program and acquisition managers should take an active role in these activities.

Executive Order 13123, Greening the Government Through Energy Efficient Management:

Section 205. Petroleum. Through life-cycle cost-effective measures, each agency shall reduce the use of petroleum within its facilities.

Energy Policy Act of 2005: Reduce FY06 energy usage by 2% over base year FY03.

Specific Legal Requirements:

None

## Paper Consumption:

Executive Orders, Guidelines, and Other Policies:

Memo, dated 1/19/01, from USEPA Deputy Administrator, W. Michael McCabe.

“When purchasing paper for copiers and printers, purchase paper with 100% recycled content with a minimum of 50% post-consumer fiber content; meet this requirement by October 1, 2001.”

Wherever available, purchase process chlorine-free paper that meets the recycled content standard; meet this requirement by October 1, 2001.”

Executive Order 13101, Greening of the Government Through Waste Prevention, Recycling, and Federal Acquisition:

Section 101, 102, 401. Prevent pollution whenever feasible; acquire environmentally preferable products. Consider the following factors in acquisition planning: use of bio-based products; use of recovered materials; reuse of product; life cycle cost; recyclability; use of environmentally preferable products; waste prevention (including toxicity reduction or elimination); and ultimate disposal.

Section 505. Minimum Content Standard for Printing and Writing Paper. Agencies shall meet or exceed the following minimum materials content standards when purchasing or causing the purchase of printing and writing paper: (a) For high speed copier paper, offset paper, forms bond, computer printout paper, carbonless paper, file folders, white woven envelopes, writing and office paper, book paper, cotton fiber paper, and cover stock, the minimum content standard shall be no less than 30 percent post-consumer materials beginning December 31, 1998.

Section 505(b). For all printing and writing papers, the minimum content standard shall be no less than 50 percent recovered materials that are a waste material byproduct of a finished product other than a paper or textile product that would otherwise be disposed of in a landfill, as determined by the State in which the facility is located.

Specific Legal Requirements:

None

**Storm Water Discharge:**

Executive Orders and Other Policies:

60 FR 40837, August 10, 1995, Guidance for Presidential Memorandum on Environmentally and Economically Beneficial Landscape Practices on Federal Landscaped Grounds: Use regionally native plants for landscaping, use construction practices that minimize impact on natural habitat, prevent pollution, implement water and energy efficient landscape practices, and create outdoor demonstration projects.

Kitsap County Ordinance 12.04.020: Stormwater Management Standards and Specifications.

Specific Legal Requirements:

WAC 173-360-305 and 173-360-372 for the handling and use of oil.

## Waste Generation:

### Executive Orders and Other Policies:

Executive Order 13101, Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition:

Section 101, 102, 401. Prevent pollution whenever feasible; acquire environmentally preferable products. Consider the following factors in acquisition planning: use of bio-based products; use of recovered materials; reuse of product; life cycle cost; recyclability; use of environmentally preferable products; waste prevention (including toxicity reduction or elimination); and ultimate disposal.

Section 502(c). Designation of Items That Contain Recovered Materials. Once items containing recovered materials have been designated by the EPA in the Comprehensive Procurement Guidelines (CPG), agencies shall modify their affirmative procurement programs to require that, to the maximum extent practicable, their purchases of products meet or exceed the EPA guidelines.

Section 601(a)(2). In addition to white paper, mixed paper/cardboard, aluminum, plastic, and glass, agencies should incorporate into their recycling programs efforts to recycle, reuse, or refurbish pallets and collect toner cartridges for remanufacturing. Agencies should also include programs to reduce or recycle, as appropriate, batteries, scrap metal, and fluorescent lamps and ballasts.

Section 705. Recycling Programs. Each agency shall initiate a program to promote cost-effective waste prevention and recycling of reusable materials in all of its facilities. Designate a recycling coordinator for each facility.

Executive Order 13148, Greening of the Government Through Leadership in Environmental Management.

Section 204. Release Reduction: Toxic Chemicals. Each agency shall reduce its reported Toxic Release Inventory (TRI) releases and off-site transfers of toxic chemicals for treatment and disposal by 10 percent annually, or by 40 percent overall by December 31, 2006.

Section 205. Use Reduction: Toxic Chemicals and Hazardous Substances and Other Pollutants. Each agency shall reduce its use of selected toxic chemicals, hazardous substances, and pollutants, or its generation of hazardous and radioactive waste types at its facilities by 50 percent by December 31, 2006.

Section 304. Pollution Prevention Return on Investment Programs. Each agency shall develop and implement a pollution prevention program at its facilities that compares the life cycle costs of treatment and/or disposal of waste and pollutant streams to the life cycle costs of alternatives that eliminate or reduce toxic chemicals or pollutants at the source. Each agency shall implement those projects that are life cycle cost effective, or otherwise offer substantial environmental or economic benefits.

Section 501. Toxics Release Inventory/Pollution Prevention Act Reporting. (a) Each agency shall comply with the provisions set forth in section 313 of EPCRA, section 6607 of the Pollution Prevention Act, all implementing regulations, and future amendments to these authorities, in light of applicable EPA guidance.

Section 502. Release Reduction: Toxic Chemicals. (a) Beginning with reporting for calendar year 2001 activities, each agency reporting under section 501 of this order

shall adopt a goal of reducing, where cost effective, the agency's total releases of toxic chemicals to the environment and off-site transfers of such chemicals for treatment and disposal by at least 10 percent annually, or by 40 percent overall by December 31, 2006.

Section 503. Use Reduction: Toxic Chemicals, Hazardous Substances, and Other Pollutants. To attain the goals of section 205 of this order: (a) Within 18 months of the date of this order, each agency with facilities shall develop and support goals to reduce the use at such agency's facilities of the priority chemicals on the list under subsection (b) of this section for identified applications and purposes, or alternative chemicals and pollutants the agency identifies under subsection (c) of this section, by at least 50 percent by December 31, 2006.

Specific Legal Requirements:

CFR Part 246, RCRA, Source Separation for Materials Recovery Guidelines.

OSHA, 29 CFR Part 1910 Occupational and Health Safety Standards:

1910.120 Hazardous Waste Operations and Emergency Response. Cleanup, corrective actions, voluntary cleanup, TSD facilities, emergency response.

1910.134 Respiratory Protection Standard. Protective equipment, including personal protective equipment for eyes, face, head, and extremities, protective clothing, respiratory devices, and protective shields and barriers, must be provided wherever it is necessary by reason of hazards of processes or environment, chemical hazards, radiological hazards, or mechanical irritants encountered.

40 CFR Part 243, RCRA, Guidelines for the Storage and Collection of Residential, Commercial, and Institutional Solid Waste.

CFR Part 246, RCRA, Source Separation for Materials Recovery Guidelines.

40 CFR Part 268, RCRA, Land Disposal Restrictions: Identifies hazardous wastes that are restricted from land disposal and defines those limited circumstances under which an otherwise prohibited waste may continue to be land disposed.

9 CFR 172.101, Purpose and Use of Hazardous Materials Table: Hazardous Materials Table designates the materials listed as hazardous materials for transportation. For each listed material, the table identifies the hazard class or specifies that the material is forbidden in transportation, and gives the proper shipping name or directs the user to the preferred proper shipping name. In addition, the Table specifies or references requirements for labeling, packaging, quantity limits aboard aircraft and vessels.

WAC Chapter 173-303, Dangerous Waste Regulations, all sections: Generally adopts all RCRA regulations. Additionally regulates chemicals based on toxicity and persistence.

40 CFR Part 273, RCRA, Standards for Universal Waste Management: 273.1(a)



Requirements for managing batteries, pesticides, thermostats, and lamps.

## **Waste Water Discharge:**

### **Executive Orders and Other Policies:**

Executive Order 13148, Greening of the Government Through Leadership in Environmental Management.

Section 304. Pollution Prevention Return on Investment Programs. Each agency shall develop and implement a pollution prevention program at its facilities that compares the life cycle costs of treatment and/or disposal of waste and pollutant streams to the life cycle costs of alternatives that eliminate or reduce toxic chemicals or pollutants at the source. Each agency shall implement those projects that are life-cycle cost effective, or otherwise offer substantial environmental or economic benefits.

Section 502. Release Reduction: Toxic Chemicals. Beginning with reporting for calendar year 2001 activities, each agency reporting under section 501 of this order shall adopt a goal of reducing, where cost effective, the agency's total releases of toxic chemicals to the environment and off-site transfers of such chemicals for treatment and disposal by at least 10 percent annually, or by 40 percent overall by December 31, 2006.

### **Specific Legal Requirements:**

40 CFR Part 116, CWA, Designation of Hazardous Substances: designates hazardous substances under section 311(b)(2)(A) of the Federal Water Pollution Control Act.

40 CFR Part 117, CWA, Determination of Reportable Quantities for Hazardous Substances.

Kitsap County Code Title 13, Water and Sewers: Prohibited discharges including but not limited to: 13.12.160 (2) Any liquids, solids or gases, which because of their nature or quantity are, or may be, sufficient, either alone or by interaction with other substances, to cause fire or explosion or be injurious in any other way to the wastewater collection and treatment system. (7) Wastewater with pH lower than 6.0 or higher than 9.0, or having any corrosive property capable of causing damage to structures, equipment or personnel.

## Water Consumption:

### Executive Orders and Other Policies:

Executive Order 13123, "Greening the Government Through Energy Efficient Management"

Section 207. Water Conservation. Through life-cycle cost-effective measures, agencies shall reduce water consumption and associated energy use in their facilities to reach the goals set under section 503(f) of this order.

Section 503(f): Within 1 years of this order, the Secretary of Energy, in collaboration with other agency heads, shall establish water conservation goals for federal agencies.

60 FR 40837, August 10, 1995, Guidance for Presidential Memorandum on Environmentally and Economically Beneficial Landscape Practices on Federal Landscaped Grounds: Use regionally native plants for landscaping, use construction practices that minimize impact on natural habitat, prevent pollution, implement water and energy efficient landscape practices, and create outdoor demonstration projects.

### Specific Legal Requirements:

40 CFR Part 141, SDWA, "National Primary Drinking Water Regulations": applies to public water system as defined in 40 CFR 141.2

40 CFR Part 142, SDWA, "National Secondary Drinking Water Regulations": applies to public water system as discussed in 40 CFR 142.3

## Internal EMS Audit Planning Checklist

### Internal Audit Preparation Checklist

Department/Site to be audited: \_\_\_\_\_

Audit Date: \_\_\_\_\_

### Audit Objectives, Scope, and Criteria

Do audit objectives test capability to maintain compliance:

☐

Yes

☐

No

Does the audit scope assess facility boundaries, activities, units, or time period:

Activities

☐

☐  
Units

☐  
Time

Does the audit criteria include programs, standards, and/or contract requirements:

☐

Program

☐

Standards

☐

Contract  
Requirements

### Audit Feasibility

Has the team assured that necessary information is available:

☐

Yes

☐

No

Has the availability of auditors been sought and gained:

☐

Yes

☐

No

### Makeup of Audit Team

Has the objectivity of the audit team been considered and assured:

☐

Considered

☐

Assured

Has the competence of the audit team been considered and assured:

☐

Considered

☐

Assured

Has the appropriateness of audit team been considered and assured:

☐☐

	Considered	Assured	
<b>Contact the Auditee</b>			
Has the audit team established a dialogue with the auditee:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Have all necessary documents been identified, requested to be made available, and are available:	<input type="checkbox"/> Identified	<input type="checkbox"/> Requested	<input type="checkbox"/> Are available
What dialogue/interaction taken place:	<input type="text"/> <input type="text"/> <input type="text"/>		
Have the logistics been determined:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
<b>Document Review</b>			
Have ambiguities been clarified:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Have all necessary records and documents been identified, requested to be made available, and are available:	<input type="checkbox"/> Identified	<input type="checkbox"/> Requested	<input type="checkbox"/> Are available
Have previous audits been requested to be made available and are available:	<input type="checkbox"/> Identified	<input type="checkbox"/> Requested	<input type="checkbox"/> Are available
Have Prior non-conformances been requested to be made available and are available:	<input type="checkbox"/> Identified	<input type="checkbox"/> Requested	<input type="checkbox"/> Are available
Have corrective/preventive actions been requested to be made available and are available:	<input type="checkbox"/> Identified	<input type="checkbox"/> Requested	<input type="checkbox"/> Are available
Have organization charts and procedures been requested to be made available and are available:	<input type="checkbox"/> Identified	<input type="checkbox"/> Requested	<input type="checkbox"/> Are available
Have monitoring and measurement records been requested to be made available and are available:	<input type="checkbox"/> Identified	<input type="checkbox"/> Requested	<input type="checkbox"/> Are available

Have compliance status records been requested to be made available and are available:

☐

Identified

☐

Requested

☐

Are available

Have permits been requested to be made available and are available:

☐

Identified

☐

Requested

☐

Are available

Have management review reports been requested to be made available and are available:

☐

Identified

☐

Requested

☐

Are available

**Auditee contacted:**

☐

Yes

**Date:**

**Auditors notified:**

☐

Yes

**Date:**

**Set opening meeting date:**

**Auditor Names**

**Date:**

## Internal EMS Audit Program Outline

### Program Background

The Region 10 Manchester Environmental Laboratory (MEL) Environmental Management System (EMS) Internal Audit Program is based on the ISO-19011 standard. The audit program encompasses the planning of the audit to ensure it effectively supports the EMS, the efficient effective execution of the audit, and the review and improvement of the audit program. The overarching purpose of the audit is to support the EMS and ensure it continually improves.

### Audit Objectives

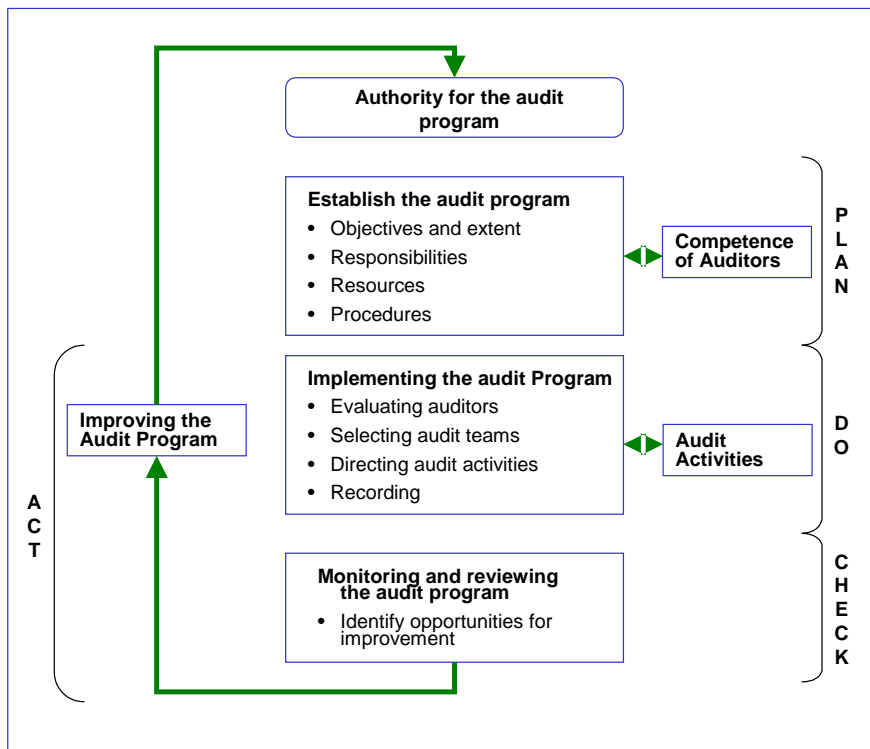
MEL's EMS Internal Audit is conducted to ascertain whether the EMS is properly implemented, is operating effectively as intended (e.g., is maintained), and is based on the environmental importance of the activity concerned. In addition, the audit provides an assessment of MEL's EMS conformance with the requirements of ISO-14001, EPA's EMS Audit Protocol, and MEL internal performance objectives. These audits also establish the regulatory status of MEL at the time of the audit.

***(Note: For additional detail regarding MEL's EMS Internal Audit see the MEL Internal EMS and Compliance Status Audit Procedure)***

### Audit Scope

The audit assesses all operations and facilities described by the background and facility description (see above) as well as all EMS elements established by MEL for these operations and facilities against the requirements of ISO-14001, EPA's Audit program, and MEL internal performance objectives.

**Audit Program Chart:** *International Organization for Standardization. (Final Draft 2002). ISO-19011: Guidelines for quality and/or environmental management systems auditing. ISO/FDIS 19011: 2002(E).*



## PLANNING THE AUDIT

### 1. Complete Audit Plan

- 1.1. Appointing the audit team leader and audit team
- 1.2. Definition of objectives, scope, and criteria (including consideration of enhancement recommendations from previous audits)
- 1.3. Initial contact with auditee and set audit date
- 1.4. Prepare the audit schedule
- 1.5. Audit teamwork assignments
- 1.6. Preparation of work documents

**Result: Audit Preparation Checklist  
Audit Plan**

## CONDUCTING THE AUDIT

### 1. Document Review

- 1.1. Review of relevant management system documents and records

*M01D: EMS Manual, Last Updated: 8/2/2006, page 112/175*



- 1.2. EMS documents
- 1.3. Other environmental and system documentation (i.e., administrative procedures)

### ***RESULT: AUDIT QUESTIONNAIRE WITH DOCUMENT REVIEW FINDINGS***

- 2. On-site Audit Activities
  - 2.1. Conducting opening meeting
    - 2.1.1. Discussing the schedule
  - 2.2. Collecting and verifying information
    - 2.2.1. Interviews, locations visited, and activities, products, and services reviewed
    - 2.2.2. Communicating during the audit (e.g., discussing corrective actions)
  - 2.3. Preparing audit conclusions
    - 2.3.1. Completing audit findings summary
    - 2.3.2. Completing Corrective Action Reports

**Result: Complete Audit Questionnaire  
Complete Interview Summaries**

### ***COMPLETE SUMMARY OF AUDIT FINDINGS Complete Corrective Action Reports***

- 3. Reporting on the Audit
  - 3.1. Audit Report
  - 3.2. Report approval and distribution
  - 3.3. Retention of documents

**Result: Final Audit Report**

### **AUDIT REVIEW**

Review audit process and identify enhancement recommendation to be included in audit plan

**Result: Audit Enhancement Table**

### **LIST EMS INTERNAL PROGRAM AUDIT DOCUMENTS**

- I. Audit Preparation Checklist Template
- II. Audit Plan Template
- III. Audit Questionnaire
- IV. Interview Template
- V. Audit Summary Template
- VI. Corrective Action Report Template
- VII. Audit Report Template
- VIII. Audit Enhancement Template

## Internal EMS Audit Plan

<b>Audit Plan No.</b>	<b>Audit Date(s)</b>	
<b>A. Audit objectives and scope</b>		
<b>B. Audit criteria</b>		
<b>C. Organization/functional units to be audited</b>		
<b>E. High priority elements</b>		
<b>F. Audit procedure(s)</b>	<b>Title</b>	<b>Revision</b>

<b>G. Communication of observations/ findings during the audit</b>	
<b>H. Reference documents</b>	<b>Revision</b>
<b>I. Time/duration of audit</b>	
<b>J. Date</b>	<b>K. Location(s)</b>
<b>L. Audit Team Members</b>	
<b>M. Pre-audit conference schedule</b>	<b>N. Daily briefings schedule</b>
<b>O. Post-audit conference schedule</b>	<b>P. Audit report schedule</b>
<b>Q. Confidentiality requirements</b>	

<b>R. Reporting and distribution requirements</b>	
<b>Prepared by:</b>	<b>Reviewed and approved by:</b>

### Internal EMS Audit Interview

<b>Interview Date:</b>		<b>Interviewer:</b>	
<b>Primary findings:</b>		<b>Interviewee:</b>	
<b>1.</b>		<b>Interviewee Position:</b>	
<b>2.</b>		<b>Interviewee Relation to EMS</b>	
<b>3.</b>			
<b>4.</b>			
<b>5.</b>			

Interview Summary:

### Internal EMS Audit Findings Summary Table

Audit Number: \_\_\_\_\_ Team Leader: \_\_\_\_\_ Date: \_\_\_\_\_  
\_\_\_\_\_

Finding No.	Category (A/B/C)	Finding	Details of Finding (Who, What, When, How)

Category A – Critical  
\_\_\_\_\_

EMS Auditor(s): \_\_\_\_\_

Category B – Major  
Category C – Minor

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### Internal EMS Audit Corrective Action Report (CAR)

Audit Date: \_\_\_\_\_

Finding Number:	Category A:	Category B:	Category C:
-----------------	-------------	-------------	-------------

Finding Description: \_\_\_\_\_

Root Cause Analysis:

Interim Actions, if any:

Corrective Actions:

Preventative Actions, if any:

Corrective Action Due Date: \_\_\_\_\_

EMS Coordinator: \_\_\_\_\_

Laboratory Director Approval: \_\_\_\_\_

Date Closed: \_\_\_\_\_

EMS Auditor Verification: \_\_\_\_\_ Date: \_\_\_\_\_



### Internal EMS Audit Program Improvement Form

<b>Date:</b>	
<b>Audit Date:</b>	
<b>Participants:</b>	
<b><i>AUDIT PROGRAM RECOMMENDATIONS:</i></b>	

Recommendations for planning	
Recommendations for conducting the audit e.g., Document review Interviews, Observations, Recording, Findings	
Recommendations for closing out the audit e.g., Audit Report, Recording, Corrective Actions, Closing Corrective Actions	
Recommendations for reviewing the audit program	

### Internal EMS Audit Questionnaire

<i><b>QUESTIONS TO ADDRESS SYSTEM REQUIREMENTS AND ROOT CAUSES</b></i>	<i><b>FINDING</b></i>	<i><b>BEST PRACTICE</b></i>	<i><b>OPPORTUNITIES TO IMPROVE</b></i>	<i><b>COMMENT</b></i>
<b>1. Questions to determine implementation and effectiveness of the Environmental Policy</b>				
<i>System Requirements:</i>				
Does the organization have an Environmental Policy?				
1. Does the policy reflect the organization's values?				
2. Does the policy drive the setting of Environmental objectives and targets?				
3. Does the policy include a commitment to the prevention of pollution?				
4. Does the policy include commitments to continual improvement and compliance to relevant laws and other requirements to which the organization subscribes?				
5. Is the policy appropriate to the nature, scale and environmental impacts of the organization's activities, products or services?				
6. Is the policy communicated to all employees and made available to the public?				
7. Is it clear that the policy has senior management's endorsement and commitment?				
8. Does the policy provide a framework for setting and reviewing environmental objectives and targets at all levels within the organization?				
<i>Root Causes:</i>				
1. Was top management involved in crafting the policy?				
2. Are there any obvious inconsistencies between the policy commitments and organizational practices?				
3. Do employees believe that management is sincere?				
4. Does management believe that environmental management will improve the quality and success of this organization?				
5. Is there evidence that sufficient resources will be allocated to the EMS implementation over a sustained period?				

<b><i>QUESTIONS TO ADDRESS SYSTEM REQUIREMENTS AND ROOT CAUSES</i></b>	<b><i>FINDING</i></b>	<b><i>BEST PRACTICE</i></b>	<b><i>OPPORTUNITIES TO IMPROVE</i></b>	<b><i>COMMENT</i></b>
<b>2. Questions to determine implementation and effectiveness of the Environmental Aspects</b>				
<i>System Requirements:</i>				
1. Has a procedure to identify the significant environmental aspects of operations, products, and services been established and implemented?				
2. Does this procedure include determining which aspects the organization can be expected to have influence over?				
3. Has the organization developed criteria for identifying those aspects which have or can have significant impacts?				
4. Have all aspects which can have significant impacts been designated as significant aspects?				
5. Have all aspects with regulatory requirements been designated as significant aspects?				
6. Is the procedure to identify significant environmental aspects exercised periodically to maintain currency?				
7. Is the procedure generally sufficient given the nature, scale and potential environmental impacts of this organization?				
<i>Root Causes:</i>				
1. Does the procedure provide for the evaluation of all inputs, processes, operations, products and services? Has this been done?				
2. Are the persons doing the evaluation sufficiently versed in environmental matters to reliably identify environmental aspects?				
3. Is there commitment to execute the procedure frequently so as to capture any new aspects?				
4. Were the products or services from external suppliers sufficiently evaluated for environmental aspects?				
5. Does the significance criteria truly reflect the values and priorities of the organization? Has there been a thoughtful consideration of the consequences?				
6. Are business exposures adequately represented in the significance criteria?				

<b><i>QUESTIONS TO ADDRESS SYSTEM REQUIREMENTS AND ROOT CAUSES</i></b>	<b><i>FINDING</i></b>	<b><i>BEST PRACTICE</i></b>	<b><i>OPPORTUNITIES TO IMPROVE</i></b>	<b><i>COMMENT</i></b>
<b>3. Questions to determine implementation and effectiveness of the Legal and Other Requirements</b>				
<i>System requirements:</i>				
1. Has a procedure to identify and provide access to applicable laws and regulation, and other environmental requirements to which the organization subscribes been established and implemented?				
2. Does the procedure identify environmental legal requirements for activities, products and services?				
3. Does the procedure address applicable international, national, states, provincial, local or contractual requirements?				
4. Is the flow of information on legal requirements reliable, competent, and unobstructed?				
5. Have the legal and other requirements been translated into non-technical language and brought to the individual(s) that will have primary responsibility for compliance? (This is the meaning of “provide access” in the standard.)				
6. Does the procedure ensure that when new aspects arise they will be reviewed for any regulatory requirements?				
<i>Root Causes:</i>				
1. Have all identified aspects been reviewed by a legally competent individual to ascertain the existence of any regulatory requirements?				
2. Are qualified individuals that can determine the applicability of regulations to specific configurations of environmental aspects accessible? Are they engaged in the process?				
3. Has the need for redundant sources of regulatory information been considered? If such a need is perceived, are there redundant sources?				
4. Do line personnel appreciate, in layman’s terms, the legal requirements that apply to their specific duties? Is this tested from time to time?				
5. Is there a general awareness among employees that legal duties attach to certain environmental responsibilities?				

<b>QUESTIONS TO ADDRESS SYSTEM REQUIREMENTS AND ROOT CAUSES</b>	<b>FINDING</b>	<b>BEST PRACTICE</b>	<b>OPPORTUNITIES TO IMPROVE</b>	<b>COMMENT</b>
<b>4. Questions to determine implementation and effectiveness of the Objectives and Targets</b>				
<i>System Requirements:</i>				
1. Are objectives and targets based on the EMS policy, take into account significant environmental aspects, legal and other requirements and the views of interested parties?				
2. Has the organization developed a method or criteria for determining who its “interested parties” are for the purposes of EMS?				
3. Does the organization keep the views of interested parties?				
4. Are there objectives and targets for all significant environmental aspects? (Even those that have already achieved their objective?)				
5. Is the objective for aspects with regulatory requirements to reach compliance?				
6. In setting objectives and targets, were technological options and its financial, operational and business requirements considered				
7. Do objectives and targets contain a commitment to P2				
8. Have the objectives and targets been distributed to each relevant function and level within the organization?				
9. Are the individuals that need to achieve objectives and targets aware of what is expected of them?				
<i>Root Causes:</i>				
1. Do the objectives and targets reflect the vision and aspirations communicated by the policy statement?				
2. Has top management agreed with the scope and reach of the objectives and targets?				
3. Will achieving the objectives and targets result in the advantages and benefits envisioned when the EMS was conceived?				
4. Does management keep track of progress towards achieving the objectives and targets?				
5. Have indicators of progress been chosen with care to allow monitoring and				

<b>QUESTIONS TO ADDRESS SYSTEM REQUIREMENTS AND ROOT CAUSES</b>	<b>FINDING</b>	<b>BEST PRACTICE</b>	<b>OPPORTUNITIES TO IMPROVE</b>	<b>COMMENT</b>
measurement with relative ease?				
6. Is responsibility for keeping track of objectives and targets, clearly designated, and is oversight sufficient to ensure this occurs?				
7. Is there a general awareness among the employees of the objectives and targets of the EMS?				
<b>5. Questions to determine implementation and effectiveness of the Environmental Management Programs</b>				
<i>System Requirements:</i>				
1. Are there EMPs for achieving all objectives and targets?				
2. Do EMPs designate responsibilities for achieving the objectives and targets at each relevant function and level of the organization?				
3. Do EMPs include the means and time frame for achievement?				
4. Have the relevant programs been revised to address new or modified activities, products or services?				
5. Do the management programs incorporate these elements of the EMS:				
• Objectives and targets				
• Structure and responsibility				
• Training, awareness and competence				
• Records, identification and retention				
• Operational control				
• Monitoring and measurement				
• Performance indicators				
• Documents to be used				
• Resources and timeframes				
<i>Root Causes:</i>				
1. Are there programs to address all significant aspects in all activities, operations, products and services in which they exist?				
2. Is there sufficient detail in the program to cover all instances of each significant aspect?				
3. Is someone in the organization designated to be responsible to oversee each program? Are responsibilities for the various parts of each program clearly				

<b>QUESTIONS TO ADDRESS SYSTEM REQUIREMENTS AND ROOT CAUSES</b>	<b>FINDING</b>	<b>BEST PRACTICE</b>	<b>OPPORTUNITIES TO IMPROVE</b>	<b>COMMENT</b>
designated?				
4. Are persons with responsibilities for various parts of each program aware and committed to their roles?				
5. Are the resources allocated to each program sufficient to make the program successful?				
6. Do designated individuals have enough time left from their other duties to allocate to the programs?				
<b>6. Questions to determine implementation and effectiveness of the Operational Controls</b>				
<i>System Requirements:</i>				
1. Have documented operational controls for activities associated with significant environmental aspects been developed and implemented?				
2. Does the organization have procedures that stipulate the operating criteria and operational controls for identified operations and activities?				
3. Does the organization have procedures to cover control situations that deviate from the environmental policy and objectives and targets?				
4. Has the organization assigned responsibility for reviewing, maintaining, and updating operational controls and procedures?				
5. Have controls and procedures been communicated to suppliers and contractors relative to any significant environmental aspects of goods and services used by the organization?				
6. Does the organization have a procedure to identify the significant environmental aspects of externally provided goods and services?				
7. Have individuals responsible for operational controls been notified and qualified for those controls?				
8. Have operators been made aware where operational controls are necessary to achieve and maintain compliance to regulatory requirements?				
<i>Root Causes:</i>				
1. Have operational controls been carefully considered and crafted for each activity, product or service that is associated with a significant aspect? (Has this really happened and did the analysis include specifying operating criteria, maintenance and backup controls?)				
2. Are the people on whom the organization relies for manning the operational				

<b>QUESTIONS TO ADDRESS SYSTEM REQUIREMENTS AND ROOT CAUSES</b>	<b>FINDING</b>	<b>BEST PRACTICE</b>	<b>OPPORTUNITIES TO IMPROVE</b>	<b>COMMENT</b>
controls aware, committed, competent and resourced to do their jobs?				
3. Is the monitoring of operational controls frequent enough to allow recovery in case of malfunction or error?				
4. Are operational controls assessed for their adequacy once they've been in place for a while?				
<b>7. Questions to determine implementation and effectiveness of the Structure and Responsibility</b>				
<i>System Requirements:</i>				
1. Have defined roles, responsibilities and authorities been established and communicated to the appropriate employees?				
2. Have sufficient financial, technical and personnel resources been made available to implement EMS?				
3. Has a management representative been appointed by senior management to oversee the EMS and to report on its performance and progress?				
4. Are roles, responsibilities and authorities appropriately specified within the environmental management programs?				
<i>Root Causes:</i>				
1. Have the employees shown that they understand their responsibilities and will actually fulfill them?				
2. Were the employees given the opportunity to structure the procedures they will follow to execute their responsibilities?				
3. When an employee leaves and another takes his/her place, is there a process for reassigning responsibilities and getting understanding, competence and commitment from the new employee?				
4. Is the understanding and commitment refreshed frequently enough so it is not forgotten or neglected?				
5. Are responsibilities fairly distributed so as not to overburden some individuals?				
6. Are the assigned responsibilities logical and a natural fit in the employee's normal duties?				



<b>QUESTIONS TO ADDRESS SYSTEM REQUIREMENTS AND ROOT CAUSES</b>	<b>FINDING</b>	<b>BEST PRACTICE</b>	<b>OPPORTUNITIES TO IMPROVE</b>	<b>COMMENT</b>
<b>8. Questions to determine implementation and effectiveness of Training, Awareness and Competence</b>				
<i>System Requirements:</i>				
1. Has the organization identified and evaluated training needs for all personnel and contractors, where appropriate, whose functions may create a significant impact on the environment?				
2. Has the organization identified training needs for providing general awareness to all employees and managers at each relevant function and level?				
3. Does training emphasize the importance of compliance with all applicable laws and regulations, conformance with the organization's environmental policy and with the requirements of the EMS?				
4. Does training emphasize the significant environmental impacts, actual or potential, of work activities?				
5. Does training emphasize the environmental benefits of improved personal performance relative to environmental aspects?				
6. Does training emphasize the roles and responsibilities of employees and on-site contractors in achieving conformity with the environmental policy and procedures?				
7. Does training emphasize the potential consequences of departure from specified operating procedures?				
8. Are all employees whose work can cause significant environmental impacts competent by training, experience, or education?				
9. Has a determination of competence for such employees been made and recorded?				
10. Does the employee know that he is deemed to be so competent?				
<i>Root Causes:</i>				

<b>QUESTIONS TO ADDRESS SYSTEM REQUIREMENTS AND ROOT CAUSES</b>	<b>FINDING</b>	<b>BEST PRACTICE</b>	<b>OPPORTUNITIES TO IMPROVE</b>	<b>COMMENT</b>
1. Are employees tested to ensure that training was effective?				
2. Are the skills or knowledge of employees deemed competent by virtue of experience or education ever tested?				
3. Is training done in a serious manner with sufficient time and skill so that employees do not take it as a joke?				
4. Do employees believe they will be held accountable for the transgression of reasonable and expected care?				
5. Does training convey concepts of responsibility and accountability?				
<b>9. Questions to determine implementation and effectiveness of the Emergency Preparedness and Response Procedure</b>				
<i>System Requirements:</i>				
1. Have emergency preparedness and response procedures been established, implemented and tested?				
2. Has the organization reviewed, and where necessary, revised its emergency preparedness and response procedures after occurrence of accidents or emergency situations?				
3. Does the scope of the emergency preparedness and response procedures address the prevention and mitigation of environmental impacts?				
4. Does the organization periodically test such procedures?				
<i>Root Causes:</i>				
1. Do existing emergency procedures actually address “environmental emergencies” as well as other emergencies?				
2. When testing emergency procedures, do the tests exercise that portion dealing with environmental consequences?				
3. Are all employees aware of simple, immediate response actions that can mitigate consequences in an environmental emergency? Are they encouraged to take such actions?				
4. Are emergency drills done with sufficient seriousness and realism so that employees actually learn something from them?				
5. Has emergency planning considered all the possible emergencies that can occur?				
6. Do these plans address realistic scenarios?				
7. Are provisions sufficient to prevent or mitigate significant harm?				

<b>QUESTIONS TO ADDRESS SYSTEM REQUIREMENTS AND ROOT CAUSES</b>	<b>FINDING</b>	<b>BEST PRACTICE</b>	<b>OPPORTUNITIES TO IMPROVE</b>	<b>COMMENT</b>
<b>10. Questions to determine implementation and effectiveness of Monitoring and Measurement</b>				
<i>System Requirements:</i>				
1. Are key characteristics of significant environmental aspects, operational controls and progress toward objectives and targets being monitored and measured (e.g., record reviews, performance observations, trend analyses)?				
2. Does the organization maintain procedures to record information to track performance, relevant operational controls and progress towards the environmental objectives and targets?				
3. Have performance indicators been specified within the environmental management programs to facilitate tracking of progress towards objectives and targets?				
4. Is environmental monitoring equipment calibrated and maintained and are records of this process kept according to the organization's procedures?				
5. Have procedures to determine the status of compliance (e.g., compliance audits or inspections) with the law been established, and are they being implemented?				
6. Is the information obtained from monitoring and measurement properly recorded and prepared for use during the management review?				
<i>Root Causes:</i>				
1. Is there a strong commitment in the organization's leadership to monitoring and measurement? Do they ask for periodic updates on measures?				
2. Have the proper monitoring and measurement tools been acquired and installed appropriately?				

<b>QUESTIONS TO ADDRESS SYSTEM REQUIREMENTS AND ROOT CAUSES</b>	<b>FINDING</b>	<b>BEST PRACTICE</b>	<b>OPPORTUNITIES TO IMPROVE</b>	<b>COMMENT</b>
3. Have operators been trained to read, record, calibrate and report on the readings from monitoring and measurement tools?				
4. Do operators exhibit a sense of discipline and desire to maintain the monitoring and measurement procedures?				
5. Are the results of monitoring and measurement used creatively to maintain the EMS momentum and to invigorate the desire of operators to continue their efforts?				
<b>11. Questions to determine implementation and effectiveness of Communications</b>				
<i>System Requirements:</i>				
1. Have internal communications procedures regarding EMS issues been established and implemented?				
2. Does the organization have procedures for receiving, documenting, and responding as necessary to relevant communication from external interested parties?				
3. Has the organization considered procedures for external communication of its significant environmental aspects?				
4. Has the organization recorded its decision on whether to have procedures for external communication of its significant environmental aspects?				
5. Does the organization have procedures to communicate with suppliers and contractors on the environmental aspects of supplies and on operational controls for on-site work?				
<i>Root Causes:</i>				
1. On a periodic basis, does the organization test the effectiveness of its communications to employees? Are people getting the word?				
2. Does the organization test contractors at times, to ensure that they have knowledge and are following required operational controls for on-site work?				
3. Is it easy and un-intimidating for employees to communicate up the chain of command?				
4. Do communications flow down to all employees or are they prone to blockages along the way?				
5. Are line managers held accountable for communications reaching the				

<b>QUESTIONS TO ADDRESS SYSTEM REQUIREMENTS AND ROOT CAUSES</b>	<b>FINDING</b>	<b>BEST PRACTICE</b>	<b>OPPORTUNITIES TO IMPROVE</b>	<b>COMMENT</b>
employees under their charge?				
6. Are communications made simple and logical and do they avoid jargon? Are they translated when necessary?				
<b>12. Questions to determine implementation and effectiveness of the Non-conformance and Corrective and Preventive Actions</b>				
<i>System Requirements:</i>				
1. Are there procedures in place that are being implemented for handling EMS non-conformances?				
2. Do these procedures define responsibility and authority for handling and investigating non-conformances?				
3. Do they define responsibility and authority for taking action to mitigate any impacts caused?				
4. Do they define responsibility and authority for initiating and completing corrective and preventive action?				
5. Have the corrective and preventive actions been appropriate to the magnitude of the problems and impacts?				
6. Following corrective and preventive actions, have any procedures that were affected by these actions been changed accordingly?				
7. Is the information on corrective and preventive actions being recorded and provided to senior management for management review?				
<i>Root Causes:</i>				
1. Are employees aware that system failures need to be reported so that they can be addressed as quickly as possible?				
2. Do the corrective and preventive actions require an analysis of "root causes"?				
3. Is there follow-up on corrective and preventive actions to ensure they are effective?				
4. Does the organizational culture encourage employees to report system deficiencies or does it discourage it? (Are employees given thanks for reporting such deficiencies?)				

<b>QUESTIONS TO ADDRESS SYSTEM REQUIREMENTS AND ROOT CAUSES</b>	<b>FINDING</b>	<b>BEST PRACTICE</b>	<b>OPPORTUNITIES TO IMPROVE</b>	<b>COMMENT</b>
5. Do the most competent individuals address non-conformances, so that corrective and preventive actions are the most effective available?				
6. Are non-conformances being closed out completely, effectively and timely?				
<b>13. Questions to determine implementation and effectiveness of the EMS Audit</b>				
<i>System Requirements:</i>				
1. Is there a program and procedure for EMS audits and is it being implemented?				
2. Can the procedure for EMS audits determine whether the EMS responds appropriately to the organization's environmental policy?				
3. Can it determine whether the EMS conforms to the organization's planned arrangements for environmental management?				
4. Can it determine whether the EMS conforms to ISO 14001?				
5. Can it determine whether the EMS had been properly implemented and maintained?				
6. Is the EMS audit schedule based on the importance of the activities and the results of previous audits?				
7. Do the audit procedures cover the audit scope, frequency, and methodologies?				
8. Do the audit procedures cover the responsibilities and requirements for conducting audits and reporting results?				
9. Is the information from EMS audits being recorded and reported to senior management for management review?				
<i>Root Causes:</i>				
1. Do the internal EMS auditors have a solid understanding of the EMS, its expectations, and the requirements?				
2. Have the internal EMS auditors received appropriate training to conduct EMS audits? (Do they know how to conduct an audit?)				
3. Is sufficient time allocated to allow the internal auditors to prepare for an audit, to execute it and to prepare the reports and any follow-ups?				

<b>QUESTIONS TO ADDRESS SYSTEM REQUIREMENTS AND ROOT CAUSES</b>	<b>FINDING</b>	<b>BEST PRACTICE</b>	<b>OPPORTUNITIES TO IMPROVE</b>	<b>COMMENT</b>
4. Are internal auditors given separate recognition (rewards) for conducting EMS audits when this is not their primary function? (Is it praiseworthy to be an internal EMS auditor?)				
5. Is there a culture of respect for auditors among employees?				
6. Do auditors see themselves as internal consultants and stewards of the EMS?				
7. Do internal auditors prepare the audit criteria and are they doing this thoughtfully, completely and with real understanding?				
<b>14. Questions to determine implementation and cohesion of EMS Documentation</b>				
<i>System Requirements:</i>				
1. Are the core elements of the EMS documented, including all of the required procedures?				
2. Does the documentation of the core elements of the EMS describe their interaction?				
3. Does documentation of the core elements of the EMS provide direction to related documentation?				
<i>Root Causes:</i>				
1. Is the description of the system, its components, its details on how things will be done and by whom complete?				
2. Are all references to other systems, sub-systems, procedures, programs, etc. incorporated in the EMS documentation?				
3. Was the documentation compiled with the intention that it would clearly describe the system, be complete and serve as a reference for those wishing to learn about the EMS?				
4. Is the documentation kept current as the EMS evolves?				
5. Is documentation seen as a necessary adjunct to a well-working system, or is it seen as useless red tape?				

<b>QUESTIONS TO ADDRESS SYSTEM REQUIREMENTS AND ROOT CAUSES</b>	<b>FINDING</b>	<b>BEST PRACTICE</b>	<b>OPPORTUNITIES TO IMPROVE</b>	<b>COMMENT</b>
<b>15. Questions to determine implementation and effectiveness of the Document Control system</b>				
<i>System Requirements:</i>				
1. Is there a procedure for managing and controlling the documents that are being implemented in the EMS to ensure that:				
• They can be located;				
• They are periodically reviewed, revised as necessary, and approved for adequacy by authorized personnel;				
• Only the current versions are in use;				
• They are located where they are needed;				
• Obsolete documents are no longer in use;				
• Documents that need to be retained are suitably identified for that purpose.				
2. Are documents legible, dated (with dates of revision) and readily identifiable?				
3. Are documents maintained in an orderly manner and retained (if required) for a specific period?				
4. Are there procedures and designation of responsibilities for the creation and modification of the various types of documents?				
<i>Root Causes:</i>				
1. The fewer the individuals that are involved in document control, the easier the task becomes. Does the procedure for document control minimize the number of people that need to be involved? (The most				



<b>QUESTIONS TO ADDRESS SYSTEM REQUIREMENTS AND ROOT CAUSES</b>	<b>FINDING</b>	<b>BEST PRACTICE</b>	<b>OPPORTUNITIES TO IMPROVE</b>	<b>COMMENT</b>
efficient document control is to do it online with only one individual responsible for making the changes to the authorized, official online copy.)				
2. If the procedure relies on a number of individuals, is there one authorized coordinator who scrupulously ensures that new copies are properly distributed and used while old copies are collected and disposed?				
3. When more than one individual is involved in document control, it is important to have a well-defined procedure and discipline to make the system work. Does this culture prevail in the organization?				
<b>16. Questions to determine implementation and effectiveness of the EMS Records</b>				
<i>System Requirements:</i>				
1. Is there a procedure for the identification, maintenance and disposition of environmental records?				
2. Are EMS records:				
• Legible				
• Identifiable and traceable to the activity, product, or service involved				
• Stored and maintained so as to be readily retrievable and protected against damage, deterioration or loss				
3. Have the retention times for EMS records been established and recorded?				
4. Are the EMS records being retained for the periods established?				
5. Are the EMS records kept to demonstrate conformance to ISO-14001?				
<i>Root Causes:</i>				
1. Does the prevailing culture assign a high value to creating, storing and maintaining records in all parts of the enterprise? (It is unlikely that environmental records will be accorded a different importance than is given to other records produced by the organization.)				
2. Does the organization apply retention times to environmental records that comply with regulatory requirements? (Is there recognition that such regulatory requirements need to be researched at the time legal and other				

<b>QUESTIONS TO ADDRESS SYSTEM REQUIREMENTS AND ROOT CAUSES</b>	<b>FINDING</b>	<b>BEST PRACTICE</b>	<b>OPPORTUNITIES TO IMPROVE</b>	<b>COMMENT</b>
requirements are being established for the list of environmental aspects?)				
3. Is responsibility for maintaining and retrieving records clearly established? Is the system for doing this reliable?				
4. Is the record system tested periodically for its integrity and reliability? How do we know the system is working?				
<b>17. Questions to determine implementation and effectiveness of the EMS Management Review</b>				
<i>System Requirements:</i>				
1. Is senior management, on a regular basis, reviewing the structure and performance of the EMS to determine the effectiveness of the EMS and identify potential opportunities for improvement?				
2. Do management reviews address the possible need for changes to policy, objectives and other elements of the organization's EMS, in light of performance information, audit results, changing circumstances and the commitment to continual improvement?				
3. Has sufficient information for this audit, including:				
• Monitoring and measurement				
• EMS audits				
• Compliance status				
• Corrective and preventive actions				
• Progress towards objectives and targets				
4. Is the review (including the decisions taken) recorded and are the records kept for a suitable period of time?				
5. Are these management reviews planned and organized by the EMS management representative?				
<i>Root Causes:</i>				
1. Does top management accept that the top goal of an EMS is to change environmental culture (That the environmental culture is as necessary and as valuable as the safety culture?)				

<b><i>QUESTIONS TO ADDRESS SYSTEM REQUIREMENTS AND ROOT CAUSES</i></b>	<b><i>FINDING</i></b>	<b><i>BEST PRACTICE</i></b>	<b><i>OPPORTUNITIES TO IMPROVE</i></b>	<b><i>COMMENT</i></b>
2. Does top management accept that their continued leadership and involvement are necessary to effect such a change in the organization's environmental culture?				
3. Does top management readily agree to participate and contribute in the management reviews?				
4. Is top management aware of and does it believe in the potential benefits that of well-established environmental culture?				
5. Are management reviews focused on the results of the system and do they consider sufficiently the evaluation and authorization of changes to promote progress and continual improvements?				

## Annual Management Review Meeting

### EMS Coordinator's Tasks:

- 1) Prepare the necessary input to be considered in the review, including:
  - a. EMS audit results.
  - b. Results of monitoring and measurement of environmental indicators.
  - c. Progress towards achievement of objectives and targets.
  - d. Regulatory compliance status.
  - e. History of corrective and preventative actions.
  - f. Any other relevant information pertaining to EMS.
- 2) Prepare agenda and presentation summarizing the current status of progress toward EMS targets.
- 3) Designate a note-taker for the meeting.
- 4) Ensure that lab managers' decisions are acted upon.
- 5) Keep a file with the records of the meeting including records of follow-up actions to implement managements' decisions.

### Lab Managers' Tasks:

- 1) Assess EMS for suitability, adequacy, and effectiveness.
- 2) Make decisions with respect to changes desired for EMS.

### Note-taker's Tasks:

- 1) Take notes during the meeting.
- 2) Deliver typed minutes to the attendees.



## EMS MANAGEMENT REVIEW MEETING

Subject:		Date & Time:	
EMS Management Review		Monday, December 19th, 2005 2:30p.m.	
Attendees:	Department:	Function:	
1. Stephanie Bailey	USEPA	EMS Coordinator	
2. Linda Anderson-Carnahan	USEPA	R10 Lab Director	
3. Stuart Magoon	WDOE	Lab Director	
4. David Dobb	Techlaw	ESAT Team Leader	
5. Matt Roach	USEPA	Minute Taker	
Information Presented:			
• PowerPoint Presentation on EMS Management Review			
General Notes from the Meeting:			
EMS training will be given in January for the 2006 Program. A refresher will be given in the 3 <sup>rd</sup> quarter of the calendar year. Trainings can take place as an all-hands meeting or as part of each agency's all-staff.			
A small FTE investment has yielded greater savings.			
EMS Program is on-track and effective.			
EMS Program has become part of an employee's day-to-day routine.			
Decisions taken with respect to the EMS system's suitability, adequacy, and effectiveness:			
	Respondent	Yes/N	Comments
Suitability:	Linda Anderson-Carnahan	Yes	Concern with increased sampling showing overall increased resource usage even though resources used per sample decrease.
	Stuart Magoon	Yes	
Adequacy:	David Dobb	Yes	Integrated into standard operating procedures.
	Linda Anderson-Carnahan	Yes	
	Stuart Magoon	Yes	
	David Dobb	Yes	
Effectiveness:	Linda Anderson-Carnahan	Yes	Saving resources
	Stuart Magoon	Yes	Saving resources
	David Dobb	Yes	It has become part of employee's daily routine.
Decisions with respect to changes desired for the EMS system:			
Person Responsible		Expected Timeline	Implementation
N/A		N/A	N/A
EMS Update, Status, & Future Review Schedules:			
Next EMS Management Meeting:			
April 2006			
August 2006			
December 2006			

# R10 LAB SIGNIFICANT IMPACTS

01/28/2003

Magnitude and Probability 1= LOW, 2=MEDIUM, 3=HIGH

Significant: Score = 6 to 9 or Impact = Regulated

Activities	Aspects	Impacts	Magnitude Probability Score		
Facility Operation & Maintenance	Air Emissions (fugitive, point source)	Exposure - health & safety	2	3	6
Heating/Air Conditioning, Operation & Maintenance	Air Emissions (fugitive, point source)	Regulated	1	3	3
Analysis and Prep of Samples (except instrumental)	Air Emissions (fugitive, point source)	Release of pollutants	2	3	6
Fumehoods Use	Air Emissions (fugitive, point source)	Release of pollutants	2	3	6
Purchasing Chemicals and Inventory Management of C	Chemical Resources	Regulated	2	3	6
Solvents Use	Chemical Resources	Release of pollutants	3	2	6
Analysis and Prep of Samples (except instrumental)	Chemical Resources	Use of natural resources	3	3	9
Construction	Contamination from Storm Water Discharge	Regulated	3	3	9
Fuel Oil Tank - Filling and Maintaining 10,000 Gal	Contamination from Storm Water Discharge	Regulated	3	3	9
Pesticide Use, Outside	Contamination from Storm Water Discharge	Regulated	3	3	9
Fuel Oil Tank - Filling and Maintaining 10,000 Gal	Contamination from Storm Water Discharge	Release of pollutants	3	2	6
Analysis and Prep of Samples (except instrumental)	Energy Consumption (electricity)	Executive Order	3	3	9
Analytical Laboratory Instrument Use	Energy Consumption (electricity)	Executive Order	3	3	9
Biological Agents - Handling, Storage and Use	Energy Consumption (electricity)	Executive Order	2	3	6
Dishwashers Use	Energy Consumption (electricity)	Executive Order	2	3	6
Fumehoods Use	Energy Consumption (electricity)	Executive Order	3	3	9
Heating/Air Conditioning, Operation & Maintenance	Energy Consumption (electricity)	Executive Order	3	3	9
Lighting Use and Maintenance	Energy Consumption (electricity)	Executive Order	3	3	9
PC Use	Energy Consumption (electricity)	Executive Order	2	3	6
Printers, Faxes and Copiers Use	Energy Consumption (electricity)	Executive Order	2	3	6

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Use of Autoclaves	Energy Consumption (electricity)	Executive Order	2	3	6
Analysis and Prep of Samples (except instrumental)	Energy Consumption (electricity)	Use of natural resources	2	3	6
Analytical Laboratory Instrument Use	Energy Consumption (electricity)	Use of natural resources	3	3	9
Biological Agents - Handling, Storage and Use	Energy Consumption (electricity)	Use of natural resources	2	3	6
Biological Safety Cabinets, Operation & Maintenance	Energy Consumption (electricity)	Use of natural resources	2	3	6
Dishwashers Use	Energy Consumption (electricity)	Use of natural resources	2	3	6
Fumehoods Use	Energy Consumption (electricity)	Use of natural resources	3	3	9
Heating/Air Conditioning, Operation & Maintenance	Energy Consumption (electricity)	Use of natural resources	3	3	9
Lighting Use and Maintenance	Energy Consumption (electricity)	Use of natural resources	3	3	9
PC Use	Energy Consumption (electricity)	Use of natural resources	2	3	6
Printers, Faxes and Copiers Use	Energy Consumption (electricity)	Use of natural resources	2	3	6
Use of Autoclaves	Energy Consumption (electricity)	Use of natural resources	2	3	6
Commuting to Work/Parking Cars	Fuel Consumption (gasoline, diesel)	Use of natural resources	3	3	9
Field Work (external, non-sampling inspections, et	Fuel Consumption (gasoline, diesel)	Use of natural resources	2	3	6
Sample Collection in Field	Fuel Consumption (gasoline, diesel)	Use of natural resources	2	3	6
Travel for Official Purposes	Fuel Consumption (gasoline, diesel)	Use of natural resources	2	3	6
Facility Operation & Maintenance	Fuel Consumption (heating oil, natural g	Use of natural resources	3	3	9
Heating/Air Conditioning, Operation & Maintenance	Fuel Consumption (heating oil, natural g	Use of natural resources	3	3	9
Analysis and Prep of Samples (except instrumental)	Microbial Contamination	Regulated	2	1	2
Analytical Laboratory Instrument - Calibration & M	Microbial Contamination	Regulated	2	1	2
Analytical Laboratory Instrument Use	Microbial Contamination	Regulated	1	1	1
Biological Safety Cabinets, Operation & Maintenance	Microbial Contamination	Regulated	2	3	6
Field Work (external, non-sampling inspections, et	Microbial Contamination	Regulated	1	1	1
Heating/Air Conditioning, Operation & Maintenance	Microbial Contamination	Regulated	2	2	4

Sample Collection in Field	Microbial Contamination	Regulated	1	1	1
Office Work	Noise	Reduced Productivity	2	3	6
Analytical Laboratory Instrument Use	Noise	Regulated	1	1	1
Biological Safety Cabinets, Operation & Maintenance	Noise	Regulated	1	1	1
Construction	Noise	Regulated	2	1	2
Dishwashers Use	Noise	Regulated	1	1	1
Fumehoods Use	Noise	Regulated	1	1	1
Grounds Maintenance	Noise	Regulated	2	2	4
Heating/Air Conditioning, Operation & Maintenance	Noise	Regulated	2	3	6
Printers, Faxes and Copiers Use	Noise	Regulated	1	1	1
Use of Autoclaves	Noise	Regulated	1	1	1
Analytical Laboratory Instrument Use	Paper Consumption	Nonhazardous waste generation	3	3	9
Data Review	Paper Consumption	Nonhazardous waste generation	2	3	6
Office Work	Paper Consumption	Nonhazardous waste generation	2	3	6
Printers, Faxes and Copiers Use	Paper Consumption	Nonhazardous waste generation	3	3	9
Analysis and Prep of Samples (except instrumental)	Paper Consumption	Regulated	1	1	1
Analytical Laboratory Instrument Use	Paper Consumption	Use of natural resources	3	3	9
Data Review	Paper Consumption	Use of natural resources	2	3	6
Office Work	Paper Consumption	Use of natural resources	3	3	9
Printers, Faxes and Copiers Use	Paper Consumption	Use of natural resources	3	3	9
Analysis and Prep of Samples (except instrumental)	Radiation	Regulated - license for sealed sources	1	1	1
Analytical Laboratory Instrument Use	Radiation	Regulated - license for sealed sources	1	3	3
Facility Operation & Maintenance	Radiation	Regulated - license for sealed sources	1	1	1
Field Equipment - Calibration & Maintenance	Radiation	Regulated - license for sealed sources	1	3	3
Commuting to Work/Parking Cars	Vehicle Exhaust Emissions	Release of pollutants	2	3	6
Field Work (external, non-sampling inspections, et	Vehicle Exhaust Emissions	Release of pollutants	2	3	6



Grounds Maintenance	Vehicle Exhaust Emissions	Release of pollutants	2	3	6
Sample Collection in Field	Vehicle Exhaust Emissions	Release of pollutants	2	3	6
Travel for Official Purposes	Vehicle Exhaust Emissions	Release of pollutants	2	3	6
Solvents Use	Waste Generation	Exposure - health & safety	3	2	6
Analysis and Prep of Samples (except instrumental)	Waste Generation	Landfill space	2	3	6
Analytical Laboratory Instrument - Calibration & M	Waste Generation	Landfill space	2	3	6
Construction	Waste Generation	Landfill space	3	2	6
Manage Nonhazardous Waste	Waste Generation	Landfill space	3	3	9
Analysis and Prep of Samples (except instrumental)	Waste Generation	Regulated	2	3	6
Analytical Laboratory Instrument - Calibration & M	Waste Generation	Regulated	2	3	6
Analytical Laboratory Instrument Use	Waste Generation	Regulated	1	3	3
Biological Agents - Handling, Storage and Use	Waste Generation	Regulated	2	1	2
Biological Safety Cabinets, Operation & Maintenance	Waste Generation	Regulated	1	1	1
Chemical Disposal	Waste Generation	Regulated	3	3	9
Chemical Handling	Waste Generation	Regulated	3	1	3
Construction	Waste Generation	Regulated	1	2	2
Facility Cleaning (cleaning products and equipment)	Waste Generation	Regulated	1	1	1
Facility Operation & Maintenance	Waste Generation	Regulated	2	2	4
Field Equipment - Calibration & Maintenance	Waste Generation	Regulated	1	2	2
Field Work (external, non-sampling inspections, et	Waste Generation	Regulated	1	1	1
Fleet Cars, Boats, mobile labs - Operation and Mai	Waste Generation	Regulated	1	3	3
Hazardous Waste Management	Waste Generation	Regulated	3	3	9
Heating/Air Conditioning, Operation & Maintenance	Waste Generation	Regulated	2	2	4
Lab Neutralization Tank, Operation and Maintenance	Waste Generation	Regulated	2	3	6
Lighting Use and Maintenance	Waste Generation	Regulated	1	2	2
Manage Nonhazardous Waste	Waste Generation	Regulated	1	1	1
Painting	Waste Generation	Regulated	1	2	2
PC Use	Waste Generation	Regulated	2	1	2

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Pesticide Use, Outside	Waste Generation	Regulated	2	3	6
Pump - Oil, Maintenance	Waste Generation	Regulated	2	3	6
Refrigerants Use	Waste Generation	Regulated	1	3	3
Safety Practices/Program (PPE, spill clean up, saf	Waste Generation	Regulated	1	3	3
Sample Collection in Field	Waste Generation	Regulated	1	3	3
Sample/Sample Container Disposal	Waste Generation	Regulated	3	3	9
Solvents Use	Waste Generation	Regulated	3	3	9
Use of Autoclaves	Waste Generation	Regulated	1	1	1
Analysis and Prep of Samples (except instrumental	Waste Water Discharge	Regulated	2	2	4
Analytical Laboratory Instrument Use	Waste Water Discharge	Regulated	1	2	2
Chemical Disposal	Waste Water Discharge	Regulated	3	1	3
Chemical Handling	Waste Water Discharge	Regulated	3	1	3
Dishwashers Use	Waste Water Discharge	Regulated	2	3	6
Drinking Water Consumption	Waste Water Discharge	Regulated	1	3	3
Facility Cleaning (cleaning products and equipment	Waste Water Discharge	Regulated	1	2	2
Facility Operation & Maintenance	Waste Water Discharge	Regulated	2	3	6
Field Equipment - Calibration & Maintenance	Waste Water Discharge	Regulated	1	1	1
Fleet Cars, Boats, mobile labs - Operation and Mai	Waste Water Discharge	Regulated	1	2	2
Heating/Air Conditioning, Operation & Maintenance	Waste Water Discharge	Regulated	3	3	9
Lab Neutralization Tank, Operation and Maintenance	Waste Water Discharge	Regulated	2	3	6
Painting	Waste Water Discharge	Regulated	1	1	1
Safety Practices/Program (PPE, spill clean up, saf	Waste Water Discharge	Regulated	1	2	2
Sample Collection in Field	Waste Water Discharge	Regulated	1	3	3
Sample/Sample Container Disposal	Waste Water Discharge	Regulated	1	1	1
Solvents Use	Waste Water Discharge	Regulated	2	2	4
Use of Autoclaves	Waste Water Discharge	Regulated	1	1	1
Water Polishing Systems Use	Waste Water Discharge	Regulated	1	1	1
Dishwashers Use	Waste Water Discharge	Release of pollutants (intentional, plan	2	3	6
Facility Operation & Maintenance	Waste Water Discharge	Release of pollutants (intentional, plan	2	3	6
Heating/Air Conditioning, Operation & Maintenance	Waste Water Discharge	Release of pollutants (intentional, plan	2	3	6
Lab Neutralization Tank,	Waste Water Discharge	Unintentional release	2	3	6

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Operation and Maintenance		of pollutants			
Dishwashers Use	Water Consumption	Use of natural resources	2	3	6
Facility Operation & Maintenance	Water Consumption	Use of natural resources	3	3	9
Heating/Air Conditioning, Operation & Maintenance	Water Consumption	Use of natural resources	3	3	9
Use of Autoclaves	Water Consumption	Use of natural resources	3	3	9
Water Polishing Systems Use	Water Consumption	Use of natural resources	3	3	9

## R10 LAB NONSIGNIFICANT IMPACTS

Activities	Aspects	Impacts	Magnitude	Probability	Score
Drinking Water Consumption	Waste Water Discharge	Contamination of facility systems	1	1	1
Chemical Handling	Waste Water Discharge	Contamination of facility systems	3	1	3
Analysis and Prep of Samples (except instrumental)	Waste Water Discharge	Contamination of facility systems	3	1	3
Safety Practices/Program (PPE, spill clean up, saf	Waste Water Discharge	Contamination of facility systems	2	1	2
Heating/Air Conditioning, Operation & Maintenance	Waste Water Discharge	Contamination of facility systems	2	1	2
Solvents Use	Waste Water Discharge	Contamination of facility systems	2	1	2
Analytical Laboratory Instrument Use	Waste Water Discharge	Contamination of facility systems	2	1	2
Facility Operation & Maintenance	Waste Water Discharge	Contamination of facility systems	1	1	1
Sample/Sample Container Disposal	Waste Water Discharge	Contamination of facility systems	3	1	3
Fleet Cars, Boats, mobile labs - Operation and Mai	Waste Water Discharge	Contamination of facility systems	1	1	1
Use of Autoclaves	Waste Water Discharge	Contamination of facility systems	1	1	1
Water Polishing Systems Use	Waste Water Discharge	Contamination of facility systems	1	1	1
Sample Collection in Field	Waste Water Discharge	Contamination of facility systems	1	1	1
Lab Neutralization Tank, Operation and Maintenance	Waste Water Discharge	Contamination of facility systems	1	1	1

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Dishwashers Use	Waste Water Discharge	Contamination of facility systems	1	1	1
Chemical Disposal	Waste Water Discharge	Contamination of facility systems	3	1	3
Biological Agents - Handling, Storage and Use	Waste Water Discharge	Contamination of facility systems	1	1	1
Facility Operation & Maintenance	Waste Water Discharge	Damage to sewage system	1	1	1
Sample/Sample Container Disposal	Waste Water Discharge	Damage to sewage system	1	1	1
Drinking Water Consumption	Waste Water Discharge	Damage to sewage system	1	1	1
Analytical Laboratory Instrument Use	Waste Water Discharge	Damage to sewage system	1	1	1
Chemical Handling	Waste Water Discharge	Damage to sewage system	1	1	1
Solvents Use	Waste Water Discharge	Damage to sewage system	1	1	1
Sample Collection in Field	Waste Water Discharge	Damage to sewage system	1	1	1
Analysis and Prep of Samples (except instrumental)	Waste Water Discharge	Damage to sewage system	1	1	1
Heating/Air Conditioning, Operation & Maintenance	Waste Water Discharge	Damage to sewage system	1	1	1
Safety Practices/Program (PPE, spill clean up, saf	Waste Water Discharge	Damage to sewage system	1	1	1
Lab Neutralization Tank, Operation and Maintenance	Waste Water Discharge	Damage to sewage system	1	1	1
Chemical Disposal	Waste Water Discharge	Damage to sewage system	1	1	1
Drinking Water Consumption	Energy Consumption (electricity)	Executive Order	1	1	1
Water Polishing Systems Use	Energy Consumption (electricity)	Executive Order	1	3	3
Commuting to Work/Parking Cars	Energy Consumption (electricity)	Executive Order	1	1	1
Facility Operation & Maintenance	Energy Consumption (electricity)	Executive Order	2	2	4
Hazardous Waste Management	Energy Consumption (electricity)	Executive Order	1	2	2
Construction	Energy Consumption (electricity)	Executive Order	1	1	1
Fleet Cars, Boats, mobile labs - Operation and Mai	Energy Consumption (electricity)	Executive Order	1	1	1
Biological Safety Cabinets, Operation & Maintenanc	Energy Consumption (electricity)	Executive Order	1	3	3
Facility Cleaning (cleaning products and equipment	Energy Consumption (electricity)	Executive Order	1	1	1

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Lab Neutralization Tank, Operation and Maintenance	Energy Consumption (electricity)	Executive Order	1	2	2
Eating in Lunchroom/Food Preparation	Energy Consumption (electricity)	Executive Order	1	1	1
Sample/Sample Container Disposal	Energy Consumption (electricity)	Executive Order	1	1	1
Sample Collection in Field	Energy Consumption (electricity)	Executive Order	1	1	1
Storing Chemicals	Energy Consumption (electricity)	Executive Order	1	2	2
Travel for Official Purposes	Energy Consumption (electricity)	Executive Order	1	1	1
Field Equipment - Calibration & Maintenance	Energy Consumption (electricity)	Executive Order	1	3	3
Analytical Laboratory Instrument - Calibration & Maintenance	Energy Consumption (electricity)	Executive Order	1	3	3
Facility Operation & Maintenance	Fuel Consumption (heating oil, natural g	Explosion hazard	3	1	3
Grounds Maintenance	Fuel Consumption (gasoline, diesel)	Explosion hazard	2	1	2
Construction	Fuel Consumption (gasoline, diesel)	Explosion hazard	2	1	2
Commuting to Work/Parking Cars	Fuel Consumption (gasoline, diesel)	Explosion hazard	2	1	2
Sample Collection in Field	Fuel Consumption (gasoline, diesel)	Explosion hazard	1	1	1
Field Work (external, non-sampling inspections, et	Fuel Consumption (gasoline, diesel)	Explosion hazard	1	1	1
Fleet Cars, Boats, mobile labs - Operation and Mai	Fuel Consumption (gasoline, diesel)	Explosion hazard	1	1	1
Analysis and Prep of Samples (except instrumental	Fuel Consumption (heating oil, natural g	Explosion hazard	1	1	1
Analytical Laboratory Instrument Use	Fuel Consumption (heating oil, natural g	Explosion hazard	2	1	2
Heating/Air Conditioning, Operation & Maintenance	Fuel Consumption (heating oil, natural g	Explosion hazard	2	1	2
Travel for Official Purposes	Fuel Consumption (gasoline, diesel)	Explosion hazard	1	1	1
Painting	Chemical Resources	Exposure - health & safety	1	2	2
Analytical Laboratory Instrument Use	Radiation	Exposure - health & safety	1	1	1
Sample Collection in Field	Chemical Resources	Exposure - health & safety	1	2	2
Chemical Disposal	Air Emissions (fugitive, point source)	Exposure - health & safety	2	2	4
Sample Collection in Field	Waste Generation	Exposure - health & safety	2	2	4

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Analysis and Prep of Samples (except instrumental)	Radiation	Exposure - health & safety	1	1	1
Storing Chemicals	Air Emissions (fugitive, point source)	Exposure - health & safety	1	2	2
Field Equipment - Calibration & Maintenance	Chemical Resources	Exposure - health & safety	1	1	1
Biological Agents - Handling, Storage and Use	Waste Generation	Exposure - health & safety	2	1	2
Chemical Disposal	Chemical Resources	Exposure - health & safety	1	2	2
Compressed Gas Use in Laboratories	Air Emissions (fugitive, point source)	Exposure - health & safety	2	1	2
Analytical Laboratory Instrument Use	Chemical Resources	Exposure - health & safety	1	2	2
Refrigerants Use	Waste Generation	Exposure - health & safety	1	2	2
Field Work (external, non-sampling inspections, et	Microbial Contamination	Exposure - health & safety	1	1	1
Analytical Laboratory Instrument - Calibration & M	Chemical Resources	Exposure - health & safety	1	2	2
Lab Neutralization Tank, Operation and Maintenance	Chemical Resources	Exposure - health & safety	2	1	2
Sample Collection in Field	Microbial Contamination	Exposure - health & safety	2	2	4
Printers, Faxes and Copiers Use	Air Emissions (fugitive, point source)	Exposure - health & safety	1	2	2
Lab Neutralization Tank, Operation and Maintenance	Waste Generation	Exposure - health & safety	1	2	2
Sample/Sample Container Disposal	Waste Generation	Exposure - health & safety	1	2	2
Field Equipment - Calibration & Maintenance	Radiation	Exposure - health & safety	1	1	1
Hazardous Waste Management	Waste Generation	Exposure - health & safety	2	2	4
Pesticide Use, Outside	Chemical Resources	Exposure - health & safety	1	2	2
Solvents Use	Chemical Resources	Exposure - health & safety	2	1	2
Chemical Disposal	Waste Generation	Exposure - health & safety	2	2	4
Solvents Use	Air Emissions (fugitive, point source)	Exposure - health & safety	1	1	1
Refrigerants Use	Air Emissions (fugitive, point source)	Exposure - health & safety	1	1	1
Construction	Vehicle Exhaust Emissions	Exposure - health & safety	1	1	1
Grounds Maintenance	Air Emissions (fugitive, point source)	Exposure - health & safety	1	1	1

Facility Cleaning (cleaning products and equipment)	Waste Generation	Exposure - health & safety	1	1	1
Use of Autoclaves	Waste Generation	Exposure - health & safety	1	1	1
Fuel Oil Tank - Filling and Maintaining 10,000 Gal	Waste Generation	Exposure - health & safety	1	1	1
Facility Operation & Maintenance	Chemical Resources	Exposure - health & safety	1	1	1
Fumehoods Use	Air Emissions (fugitive, point source)	Exposure - health & safety	1	1	1
Field Equipment - Calibration & Maintenance	Waste Generation	Exposure - health & safety	1	1	1
Biological Agents - Handling, Storage and Use	Air Emissions (fugitive, point source)	Exposure - health & safety	2	2	4
Chemical Handling	Waste Generation	Exposure - health & safety	2	2	4
Safety Practices/Program (PPE, spill clean up, saf	Radiation	Exposure - health & safety	1	1	1
Analytical Laboratory Instrument - Calibration & M	Microbial Contamination	Exposure - health & safety	1	1	1
Analytical Laboratory Instrument Use	Waste Generation	Exposure - health & safety	2	2	4
Compressed Gas Use in Laboratories	Chemical Resources	Exposure - health & safety	1	1	1
Construction	Air Emissions (fugitive, point source)	Exposure - health & safety	1	1	1
Field Equipment - Calibration & Maintenance	Air Emissions (fugitive, point source)	Exposure - health & safety	1	1	1
Facility Operation & Maintenance	Radiation	Exposure - health & safety	1	1	1
Heating/Air Conditioning, Operation & Maintenance	Waste Generation	Exposure - health & safety	1	1	1
Field Equipment - Calibration & Maintenance	Microbial Contamination	Exposure - health & safety	1	1	1
Commuting to Work/Parking Cars	Chemical Resources	Exposure - health & safety	1	1	1
Painting	Waste Generation	Exposure - health & safety	1	1	1
Heating/Air Conditioning, Operation & Maintenance	Air Emissions (fugitive, point source)	Exposure - health & safety	1	1	1
Printers, Faxes and Copiers Use	Chemical Resources	Exposure - health & safety	1	1	1
Analytical Laboratory Instrument Use	Air Emissions (fugitive, point source)	Exposure - health & safety	1	1	1
Analysis and Prep of Samples (except instrumental	Waste Generation	Exposure - health & safety	2	2	4
Chemical Handling	Air Emissions (fugitive, point source)	Exposure - health & safety	1	1	1

Biological Safety Cabinets, Operation & Maintenance	Air Emissions (fugitive, point source)	Exposure - health & safety	1	1	1
Analysis and Prep of Samples (except instrumental)	Microbial Contamination	Exposure - health & safety	1	1	1
Fuel Oil Tank - Filling and Maintaining 10,000 Gal	Air Emissions (fugitive, point source)	Exposure - health & safety	1	1	1
Travel for Official Purposes	Vehicle Exhaust Emissions	Exposure - health & safety	1	1	1
Pesticide Use, Outside	Waste Generation	Exposure - health & safety	1	2	2
Heating/Air Conditioning, Operation & Maintenance	Microbial Contamination	Exposure - health & safety	1	2	2
Biological Agents - Handling, Storage and Use	Chemical Resources	Exposure - health & safety	1	2	2
Lab Neutralization Tank, Operation and Maintenance	Air Emissions (fugitive, point source)	Exposure - health & safety	1	1	1
Analytical Laboratory Instrument - Calibration & M	Air Emissions (fugitive, point source)	Exposure - health & safety	1	1	1
Safety Practices/Program (PPE, spill clean up, saf	Waste Generation	Exposure - health & safety	2	2	4
Painting	Air Emissions (fugitive, point source)	Exposure - health & safety	2	2	4
Biological Safety Cabinets, Operation & Maintenance	Waste Generation	Exposure - health & safety	1	1	1
Construction	Waste Generation	Exposure - health & safety	1	1	1
Sample Collection in Field	Vehicle Exhaust Emissions	Exposure - health & safety	1	1	1
Field Work (external, non-sampling inspections, et	Vehicle Exhaust Emissions	Exposure - health & safety	1	1	1
Fleet Cars, Boats, mobile labs - Operation and Mai	Chemical Resources	Exposure - health & safety	1	1	1
Facility Cleaning (cleaning products and equipment	Chemical Resources	Exposure - health & safety	1	3	3
Facility Cleaning (cleaning products and equipment	Air Emissions (fugitive, point source)	Exposure - health & safety	1	3	3
Analytical Laboratory Instrument - Calibration & M	Waste Generation	Exposure - health & safety	2	2	4
Biological Safety Cabinets, Operation & Maintenance	Microbial Contamination	Exposure - health & safety	1	1	1
Pump - Oil, Maintenance	Waste Generation	Exposure - health & safety	1	1	1
Travel for Official Purposes	Chemical Resources	Exposure - health & safety	1	1	1
Sample Collection in Field	Air Emissions (fugitive, point source)	Exposure - health & safety	1	3	3
Analysis and Prep of Samples (except instrumental)	Chemical Resources	Exposure - health & safety	1	3	3



Heating/Air Conditioning, Operation & Maintenance	Chemical Resources	Exposure - health & safety	1	1	1
Facility Operation & Maintenance	Waste Generation	Exposure - health & safety	1	2	2
Fleet Cars, Boats, mobile labs - Operation and Mai	Vehicle Exhaust Emissions	Exposure - health & safety	1	1	1
Field Work (external, non-sampling inspections, et	Waste Generation	Exposure - health & safety	1	1	1
Construction	Chemical Resources	Exposure - health & safety	1	1	1
Safety Practices/Program (PPE, spill clean up, saf	Chemical Resources	Exposure - health & safety	1	3	3
Commuting to Work/Parking Cars	Vehicle Exhaust Emissions	Exposure - health & safety	1	1	1
Analytical Laboratory Instrument Use	Microbial Contamination	Exposure - health & safety	1	1	1
Grounds Maintenance	Vehicle Exhaust Emissions	Exposure - health & safety	2	2	4
Fleet Cars, Boats, mobile labs - Operation and Mai	Air Emissions (fugitive, point source)	Exposure - health & safety	1	1	1
Pesticide Use, Outside	Air Emissions (fugitive, point source)	Exposure - health & safety	1	3	3
Fleet Cars, Boats, mobile labs - Operation and Mai	Waste Generation	Exposure - health & safety	1	1	1
Analysis and Prep of Samples (except instrumental	Air Emissions (fugitive, point source)	Exposure - health & safety	2	1	2
Lighting Use and Maintenance	Waste Generation	Exposure - health & safety	1	1	1
Sample Collection in Field	Microbial Contamination	Generation of waste	1	1	1
Biological Safety Cabinets, Operation & Maintenanc	Microbial Contamination	Generation of waste	1	3	3
Analytical Laboratory Instrument - Calibration & M	Microbial Contamination	Generation of waste	1	3	3
Heating/Air Conditioning, Operation & Maintenance	Microbial Contamination	Generation of waste	1	1	1
Analytical Laboratory Instrument Use	Microbial Contamination	Generation of waste	1	2	2
Field Equipment - Calibration & Maintenance	Microbial Contamination	Generation of waste	1	1	1
Analysis and Prep of Samples (except instrumental	Microbial Contamination	Generation of waste	1	3	3
Field Work (external, non-sampling inspections, et	Microbial Contamination	Generation of waste	1	1	1
Dishwashers Use	Noise	Hearing impairment	1	1	1
Grounds Maintenance	Noise	Hearing impairment	1	1	1
Fumehoods Use	Noise	Hearing impairment	1	1	1
Construction	Noise	Hearing impairment	1	1	1

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Printers, Faxes and Copiers Use	Noise	Hearing impairment	1	1	1
Heating/Air Conditioning, Operation & Maintenance	Noise	Hearing impairment	1	2	2
Biological Safety Cabinets, Operation & Maintenance	Noise	Hearing impairment	1	1	1
Use of Autoclaves	Noise	Hearing impairment	1	1	1
Analytical Laboratory Instrument Use	Noise	Hearing impairment	1	1	1
Biological Agents - Handling, Storage and Use	Waste Generation	Landfill space	2	2	4
Facility Cleaning (cleaning products and equipment)	Waste Generation	Landfill space	1	3	3
Heating/Air Conditioning, Operation & Maintenance	Waste Generation	Landfill space	2	2	4
Fuel Oil Tank - Filling and Maintaining 10,000 Gal	Waste Generation	Landfill space	1	1	1
Eating in Lunchroom/Food Preparation	Waste Generation	Landfill space	2	2	4
Sample/Sample Container Disposal	Waste Generation	Landfill space	1	3	3
Field Equipment - Calibration & Maintenance	Waste Generation	Landfill space	1	1	1
Solvents Use	Waste Generation	Landfill space	1	1	1
Analytical Laboratory Instrument Use	Waste Generation	Landfill space	1	2	2
Field Work (external, non-sampling inspections, et	Waste Generation	Landfill space	1	1	1
Chemical Disposal	Waste Generation	Landfill space	1	1	1
Safety Practices/Program (PPE, spill clean up, saf	Waste Generation	Landfill space	1	1	1
Lab Neutralization Tank, Operation and Maintenance	Waste Generation	Landfill space	1	1	1
Hazardous Waste Management	Waste Generation	Landfill space	1	1	1
PC Use	Waste Generation	Landfill space	1	2	2
Use of Autoclaves	Waste Generation	Landfill space	2	2	4
Office Work	Waste Generation	Landfill space	1	2	2
Pesticide Use, Outside	Waste Generation	Landfill space	1	1	1
Data Review	Waste Generation	Landfill space	1	1	1
Water Polishing Systems Use	Waste Generation	Landfill space	1	1	1
Chemical Handling	Waste Generation	Landfill space	1	1	1
Lighting Use and Maintenance	Waste Generation	Landfill space	1	1	1
Biological Safety Cabinets, Operation & Maintenance	Waste Generation	Landfill space	1	1	1
Fleet Cars, Boats, mobile labs - Operation and Mai	Waste Generation	Landfill space	1	1	1

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Pump - Oil, Maintenance	Waste Generation	Landfill space	1	1	1
Painting	Waste Generation	Landfill space	1	1	1
Facility Operation & Maintenance	Waste Generation	Landfill space	1	2	2
Printers, Faxes and Copiers Use	Waste Generation	Landfill space	1	1	1
Sample Collection in Field	Waste Generation	Landfill space	1	1	1
Biological Agents - Handling, Storage and Use	Waste Water Discharge	Microbial contamination	1	1	1
Sample/Sample Container Disposal	Waste Water Discharge	Microbial contamination (unintentional,	1	1	1
Analysis and Prep of Samples (except instrumental	Waste Water Discharge	Microbial contamination (unintentional,	1	1	1
Drinking Water Consumption	Waste Water Discharge	Microbial contamination (unintentional,	1	1	1
Safety Practices/Program (PPE, spill clean up, saf	Waste Water Discharge	Microbial contamination (unintentional,	1	1	1
Analytical Laboratory Instrument Use	Waste Water Discharge	Microbial contamination (unintentional,	2	1	2
Sample Collection in Field	Waste Water Discharge	Microbial contamination (unintentional,	2	1	2
Facility Operation & Maintenance	Waste Water Discharge	Microbial contamination (unintentional,	1	1	1
Use of Autoclaves	Waste Water Discharge	Microbial contamination (unintentional,	2	1	2
Fleet Cars, Boats, mobile labs - Operation and Mai	Waste Water Discharge	Microbial contamination (unintentional,	1	1	1
Analytical Laboratory Instrument - Calibration & M	Paper Consumption	Nonhazardous waste generation	1	1	1
Hazardous Waste Management	Paper Consumption	Nonhazardous waste generation	1	2	2
Eating in Lunchroom/Food Preparation	Paper Consumption	Nonhazardous waste generation	1	2	2
Field Equipment - Calibration & Maintenance	Paper Consumption	Nonhazardous waste generation	1	1	1
Biological Agents - Handling, Storage and Use	Paper Consumption	Nonhazardous waste generation	1	1	1
Analysis and Prep of Samples (except instrumental	Paper Consumption	Nonhazardous waste generation	1	1	1
Facility Cleaning (cleaning	Paper Consumption	Nonhazardous waste	1	1	1

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products and equipment		generation			
Field Work (external, non-sampling inspections, et	Paper Consumption	Nonhazardous waste generation	1	2	2
Sample Collection in Field	Paper Consumption	Nonhazardous waste generation	1	2	2
Fleet Cars, Boats, mobile labs - Operation and Mai	Paper Consumption	Nonhazardous waste generation	1	1	1
Facility Operation & Maintenance	Paper Consumption	Nonhazardous waste generation	1	2	2
Safety Practices/Program (PPE, spill clean up, saf	Paper Consumption	Nonhazardous waste generation	1	1	1
Chemical Disposal	Paper Consumption	Nonhazardous waste generation	1	3	3
Chemical Handling	Paper Consumption	Nonhazardous waste generation	1	2	2
Drinking Water Consumption	Paper Consumption	Nonhazardous waste generation	1	1	1
Travel for Official Purposes	Paper Consumption	Nonhazardous waste generation	1	1	1
Field Work (external, non-sampling inspections, et	Microbial Contamination	Release of microbials into environment	1	1	1
Heating/Air Conditioning, Operation & Maintenance	Microbial Contamination	Release of microbials into environment	2	2	4
Sample Collection in Field	Microbial Contamination	Release of microbials into environment	1	2	2
Analysis and Prep of Samples (except instrumental	Microbial Contamination	Release of microbials into environment	1	2	2
Analytical Laboratory Instrument Use	Microbial Contamination	Release of microbials into environment	1	1	1
Biological Safety Cabinets, Operation & Maintenanc	Microbial Contamination	Release of microbials into environment	1	1	1
Analytical Laboratory Instrument - Calibration & M	Microbial Contamination	Release of microbials into environment	1	2	2
Travel for Official Purposes	Chemical Resources	Release of pollutants	1	1	1
Lab Neutralization Tank, Operation and Maintenance	Air Emissions (fugitive, point source)	Release of pollutants	1	1	1
Compressed Gas Use in Laboratories	Chemical Resources	Release of pollutants	1	1	1
Analytical Laboratory Instrument - Calibration & M	Air Emissions (fugitive, point source)	Release of pollutants	1	1	1
Printers, Faxes and Copiers Use	Chemical Resources	Release of pollutants	1	1	1

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Field Equipment - Calibration & Maintenance	Air Emissions (fugitive, point source)	Release of pollutants	1	1	1
Solvents Use	Air Emissions (fugitive, point source)	Release of pollutants	1	1	1
Fleet Cars, Boats, mobile labs - Operation and Mai	Air Emissions (fugitive, point source)	Release of pollutants	1	1	1
Field Equipment - Calibration & Maintenance	Chemical Resources	Release of pollutants	1	1	1
Biological Safety Cabinets, Operation & Maintenanc	Air Emissions (fugitive, point source)	Release of pollutants	1	1	1
Construction	Air Emissions (fugitive, point source)	Release of pollutants	1	1	1
Construction	Chemical Resources	Release of pollutants	1	1	1
Fleet Cars, Boats, mobile labs - Operation and Mai	Chemical Resources	Release of pollutants	1	1	1
Printers, Faxes and Copiers Use	Air Emissions (fugitive, point source)	Release of pollutants	1	3	3
Analytical Laboratory Instrument Use	Chemical Resources	Release of pollutants	1	2	2
Sample Collection in Field	Waste Water Discharge	Release of pollutants	1	3	3
Grounds Maintenance	Contamination from Storm Water Discharge	Release of pollutants	1	2	2
Analytical Laboratory Instrument Use	Air Emissions (fugitive, point source)	Release of pollutants	1	3	3
Biological Agents - Handling, Storage and Use	Chemical Resources	Release of pollutants	1	2	2
Safety Practices/Program (PPE, spill clean up, saf	Chemical Resources	Release of pollutants	1	3	3
Pesticide Use, Outside	Contamination from Storm Water Discharge	Release of pollutants	1	2	2
Chemical Disposal	Chemical Resources	Release of pollutants	1	2	2
Refrigerants Use	Air Emissions (fugitive, point source)	Release of pollutants	1	2	2
Sample Collection in Field	Chemical Resources	Release of pollutants	1	3	3
Facility Operation & Maintenance	Chemical Resources	Release of pollutants	1	2	2
Chemical Handling	Air Emissions (fugitive, point source)	Release of pollutants	1	2	2
Water Polishing Systems Use	Chemical Resources	Release of pollutants	1	2	2
Fuel Oil Tank - Filling and Maintaining 10,000 Gal	Air Emissions (fugitive, point source)	Release of pollutants	1	2	2
Biological Agents - Handling, Storage and Use	Air Emissions (fugitive, point source)	Release of pollutants	1	2	2
Commuting to Work/Parking Cars	Chemical Resources	Release of pollutants	1	2	2
Heating/Air Conditioning, Operation & Maintenance	Chemical Resources	Release of pollutants	1	2	2

Painting	Air Emissions (fugitive, point source)	Release of pollutants	1	3	3
Painting	Chemical Resources	Release of pollutants	1	2	2
Storing Chemicals	Air Emissions (fugitive, point source)	Release of pollutants	1	2	2
Pesticide Use, Outside	Air Emissions (fugitive, point source)	Release of pollutants	1	3	3
Analysis and Prep of Samples (except instrumental)	Energy Consumption (Electricity)	Release of pollutants	1	3	3
Chemical Handling	Chemical Resources	Release of pollutants	2	2	4
Construction	Contamination from Storm Water Discharge	Release of pollutants	2	2	4
Analytical Laboratory Instrument - Calibration & M	Chemical Resources	Release of pollutants	2	2	4
Grounds Maintenance	Air Emissions (fugitive, point source)	Release of pollutants	1	3	3
Pesticide Use, Outside	Chemical Resources	Release of pollutants	1	3	3
Facility Cleaning (cleaning products and equipment)	Chemical Resources	Release of pollutants	1	3	3
Chemical Disposal	Air Emissions (fugitive, point source)	Release of pollutants	1	1	1
Lab Neutralization Tank, Operation and Maintenance	Chemical Resources	Release of pollutants	1	3	3
Facility Cleaning (cleaning products and equipment)	Air Emissions (fugitive, point source)	Release of pollutants	1	3	3
Heating/Air Conditioning, Operation & Maintenance	Air Emissions (fugitive, point source)	Release of pollutants	1	3	3
Compressed Gas Use in Laboratories	Air Emissions (fugitive, point source)	Release of pollutants	1	1	1
Facility Operation & Maintenance	Air Emissions (fugitive, point source)	Release of pollutants	1	3	3
Sample Collection in Field	Air Emissions (fugitive, point source)	Release of pollutants	1	3	3
Facility Operation & Maintenance	Contamination from Storm Water Discharge	Release of pollutants	1	2	2
Construction	Vehicle Exhaust Emissions	Release of pollutants	1	2	2
Fleet Cars, Boats, mobile labs - Operation and Mai	Vehicle Exhaust Emissions	Release of pollutants	1	1	1
Safety Practices/Program (PPE, spill clean up, saf	Waste Water Discharge	Release of pollutants (intentional, plan	2	1	2
Drinking Water Consumption	Waste Water Discharge	Release of pollutants (intentional, plan	1	1	1
Sample/Sample Container Disposal	Waste Water Discharge	Release of pollutants (intentional, plan	1	3	3
Fleet Cars, Boats, mobile labs - Operation and Mai	Waste Water Discharge	Release of pollutants (intentional, plan	2	1	2
Lab Neutralization Tank,	Waste Water Discharge	Release of pollutants	1	2	2

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Operation and Maintenance		(intentional, plan			
Analytical Laboratory		Release of pollutants			
Instrument Use	Waste Water Discharge	(intentional, plan	2	1	2
		Release of pollutants			
Chemical Handling	Waste Water Discharge	(intentional, plan	2	1	2
		Release of pollutants			
Painting	Waste Water Discharge	(intentional, plan	1	2	2
		Release of pollutants			
Chemical Disposal	Waste Water Discharge	(intentional, plan	3	1	3
Analysis and Prep of Samples		Release of pollutants			
(except instrumental	Waste Water Discharge	(intentional, plan	3	1	3
		Release of pollutants			
Solvents Use	Waste Water Discharge	(intentional, plan	2	1	2
Facility Cleaning (cleaning		Release of pollutants			
products and equipment	Waste Water Discharge	(intentional, plan	1	2	2
		Release of pollutants			
Use of Autoclaves	Waste Water Discharge	(intentional, plan	1	1	1
		Unintentional release			
Sample Collection in Field	Waste Water Discharge	of pollutants	1	1	1
		Unintentional release			
Solvents Use	Waste Water Discharge	of pollutants	2	1	2
		Unintentional release			
Use of Autoclaves	Waste Water Discharge	of pollutants	2	1	2
Fleet Cars, Boats, mobile labs		Unintentional release			
- Operation and Mai	Waste Water Discharge	of pollutants	2	1	2
		Unintentional release			
Chemical Disposal	Waste Water Discharge	of pollutants	3	1	3
Analysis and Prep of Samples		Unintentional release			
(except instrumental	Waste Water Discharge	of pollutants	1	1	1
Sample/Sample Container		Unintentional release			
Disposal	Waste Water Discharge	of pollutants	3	1	3
		Unintentional release			
Chemical Handling	Waste Water Discharge	of pollutants	3	1	3
		Unintentional release			
Dishwashers Use	Waste Water Discharge	of pollutants	2	1	2
Biological Agents - Handling,		Unintentional release			
Storage and Use	Waste Water Discharge	of pollutants	2	1	2
		Unintentional release			
Heating/Air Conditioning,		of pollutants			
Operation & Maintenance	Waste Water Discharge		1	2	2
Analytical Laboratory		Unintentional release			
Instrument Use	Waste Water Discharge	of pollutants	2	1	2
		Unintentional release			
Painting	Waste Water Discharge	of pollutants	1	2	2
Field Equipment - Calibration		Unintentional release			
& Maintenance	Waste Water Discharge	of pollutants	1	1	1
		Use of natural			
Drinking Water Consumption	Paper Consumption	resources	1	1	1
Sample/Sample Container	Energy Consumption	Use of natural	1	1	1

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Disposal	(electricity)	resources			
Safety Practices/Program (PPE, spill clean up, saf	Water Consumption	Use of natural resources	1	1	1
Drinking Water Consumption	Energy Consumption (electricity)	Use of natural resources	1	1	1
Chemical Disposal	Water Consumption	Use of natural resources	1	1	1
Facility Cleaning (cleaning products and equipment	Paper Consumption	Use of natural resources	1	1	1
Painting	Water Consumption	Use of natural resources	1	1	1
Solvents Use	Water Consumption	Use of natural resources	1	1	1
Fleet Cars, Boats, mobile labs - Operation and Mai	Energy Consumption (electricity)	Use of natural resources	1	1	1
Commuting to Work/Parking Cars	Energy Consumption (electricity)	Use of natural resources	1	1	1
Analytical Laboratory Instrument - Calibration & M	Paper Consumption	Use of natural resources	1	3	3
Travel for Official Purposes	Energy Consumption (electricity)	Use of natural resources	1	1	1
Field Equipment - Calibration & Maintenance	Paper Consumption	Use of natural resources	1	1	1
Analysis and Prep of Samples (except instrumental	Paper Consumption	Use of natural resources	1	3	3
Sample Collection in Field	Water Consumption	Use of natural resources	1	3	3
Drinking Water Consumption	Water Consumption	Use of natural resources	1	3	3
Fleet Cars, Boats, mobile labs - Operation and Mai	Paper Consumption	Use of natural resources	1	1	1
Fleet Cars, Boats, mobile labs - Operation and Maintenance	Fuel Consumption (gasoline, diesel)	Use of natural resources	1	1	1
Construction	Fuel Consumption (gasoline, diesel)	Use of natural resources	1	3	3
Analytical Laboratory Instrument - Calibration & M	Water Consumption	Use of natural resources	1	1	1
Analytical Laboratory Instrument Use	Fuel Consumption (heating oil, natural g	Use of natural resources	1	1	1
Biological Agents - Handling, Storage and Use	Water Consumption	Use of natural resources	1	1	1
Grounds Maintenance	Fuel Consumption (gasoline, diesel)	Use of natural resources	1	3	3
Chemical Disposal	Paper Consumption	Use of natural resources	1	3	3
Water Polishing Systems Use	Energy Consumption (electricity)	Use of natural resources	1	3	3
Analysis and Prep of Samples	Water Consumption	Use of natural	1	2	2

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(except instrumental		resources			
Analysis and Prep of Samples (except instrumental	Fuel Consumption (heating oil, natural g	Use of natural resources	1	1	1
Facility Cleaning (cleaning products and equipment	Water Consumption	Use of natural resources	1	2	2
Office Work	Water Consumption	Use of natural resources	1	2	2
Travel for Official Purposes	Paper Consumption	Use of natural resources	1	2	2
Chemical Handling	Water Consumption	Use of natural resources	1	1	1
Sample Collection in Field	Paper Consumption	Use of natural resources	1	2	2
Grounds Maintenance	Water Consumption	Use of natural resources	1	2	2
Analytical Laboratory Instrument Use	Water Consumption	Use of natural resources	1	2	2
Fleet Cars, Boats, mobile labs - Operation and Mai	Water Consumption	Use of natural resources	1	2	2
Sample Collection in Field	Energy Consumption (electricity)	Use of natural resources	1	1	1
Safety Practices/Program (PPE, spill clean up, saf	Paper Consumption	Use of natural resources	1	2	2
Biological Agents - Handling, Storage and Use	Paper Consumption	Use of natural resources	1	2	2
Sample/Sample Container Disposal	Water Consumption	Use of natural resources	1	2	2
Field Work (external, non-sampling inspections, et	Paper Consumption	Use of natural resources	1	2	2
Chemical Handling	Paper Consumption	Use of natural resources	1	2	2
Construction	Water Consumption	Use of natural resources	1	1	1
Lab Neutralization Tank, Operation and Maintenance	Energy Consumption (electricity)	Use of natural resources	2	2	4
Facility Operation & Maintenance	Paper Consumption	Use of natural resources	1	2	2
Facility Cleaning (cleaning products and equipment	Energy Consumption (electricity)	Use of natural resources	1	2	2
Eating in Lunchroom/Food Preparation	Paper Consumption	Use of natural resources	1	2	2
Hazardous Waste Management	Paper Consumption	Use of natural resources	1	2	2
Eating in Lunchroom/Food Preparation	Energy Consumption (electricity)	Use of natural resources	1	2	2
Field Equipment - Calibration & Maintenance	Water Consumption	Use of natural resources	1	1	1
Storing Chemicals	Energy Consumption	Use of natural	1	2	2

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	(electricity)	resources			
Analytical Laboratory	Energy Consumption	Use of natural			
Instrument - Calibration & M	(electricity)	resources	1	2	2
	Energy Consumption	Use of natural			
Construction	(electricity)	resources	1	2	2
Field Equipment - Calibration	Energy Consumption	Use of natural			
& Maintenance	(electricity)	resources	1	2	2
Facility Operation &	Energy Consumption	Use of natural			
Maintenance	(electricity)	resources	1	2	2
Hazardous Waste	Energy Consumption	Use of natural			
Management	(electricity)	resources	1	2	2
Eating in Lunchroom/Food		Use of natural			
Preparation	Water Consumption	resources	1	2	2
Analysis and Prep of Samples		Use of treatment			
(except instrumental	Waste Water Discharge	plant capacity	1	1	1

## SOME USEFUL EMS DEFINITIONS

**Activities, Products and Services** - A catch-all phrase that was developed by Technical Committee 207 of ISO, to capture all of the things at a facility or organization that can interact with the environment.

**Environment** – The surroundings in which an organization operates; to include air, water, land, natural resources, flora, fauna, humans, and their interrelation.

**Environmental Aspect** - Elements of an organization's activities, products, or services that can interact with the environment. (The environmental aspect of an activity is that part of it that creates a possibility for an environmental impact. As such, it is equivalent to the concept of "hazard", in Safety, which is also defined as the mere possibility of a negative event.)

**Environmental Impact** - Change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products or services.

**Environmental Management System** - The part of the overall management system that includes organizational structure, planning activities, responsibilities, practices, procedures, processes, and resources for developing, integrating, achieving, reviewing and maintaining environmental policy.

**Environmental Objective** - Overall environmental goal arising from the environmental policy that an organization sets to achieve and which is quantified where practicable.

**Environmental Performance** - Measurable results of the environmental management system, related to an organization's control of its environmental aspects, based on its environmental policy, objectives and targets.

**Environmental Target** – A detailed performance requirement, quantified where practicable, applicable to the organization or parts thereof, that arises from the environmental objectives and that needs to be set and met in order to achieve those objectives.

**Likelihood** - Likelihood is a measure of how often an aspect can be expected to occur within an activity given the probability of its occurrence for each repetition of the activity and the frequency of the activity over time.

**Organization** - Company, corporation, firm, enterprise, authority or institution, or part or combination thereof, whether incorporated or not, public or private, that has its own functions and administration.

**Potential Environmental Impact** - The potential environmental impact of an aspect is defined by its likelihood of occurrence and likely consequences. It is equivalent to the concept of "risk", in Safety, which assigns a probability and consequence to the possible negative event that may result from a "hazard."

**Significant Environmental Aspect** - This is an environmental aspect that has or can have a significant impact on the environment, the organization, or to the mission of the organization.

**Top Management** - That level of management that has executive jurisdiction over the EMS, including the full authority to allocate appropriate resources for its execution.

## WHAT IS AN ENVIRONMENTAL MANAGEMENT SYSTEM OR EMS?

Formal Environmental Management Systems (EMS) emerged in the early 1990s to provide organizations with a proactive, systematic approach for managing the potential environmental consequences of their operations. Such systems have been widely adopted by industry and Government and have been effective at improving an organization's regulatory compliance and environmental performance.

### EMS Background

Although several recognized EMS frameworks exist, most are based on the International Organization for Standardization's ISO-14001 EMS standard. ISO-14001 is the framework on which organizations most frequently choose to base their EMS, and this is proving to be the case with U.S. federal facilities. AEE-200 basis its EMS on the principles of ISO 14001 incorporating concepts from Health and Safety Systems. All EMS are based on a cycle of four steps described below.

#### Phase 1: Planning

The organization identifies how its operations might harm the environment, and develops methods to reduce this harm.

#### Phase 2: Doing

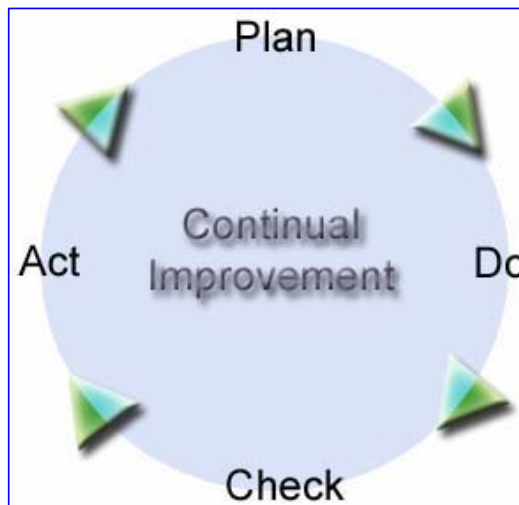
The organization implements these methods to reduce harm and operates them for a designated time period.

#### Phase 3: Checking

The organization assesses whether the methods that it is operating to reduce environmental harm and ensure regulatory compliance are proving to be effective.

#### Phase 4: Acting

The organization determines what changes are necessary based on the performance assessment of the methods (see Phase 3) designed to reduce environmental harm.



*A more detailed description of the key elements that make up an ISO 14000 based environmental management system can be found in the EMS Key Elements.*

The findings of Phase 4 may indicate that adjustments to methods already in place are necessary or that entirely new methods are needed to achieve established environmental objectives. Output from this phase is fed back into Phase 1 Planning, to make necessary changes and additions designed to bring the EMS to the desired level of effectiveness. This system feedback propels the

continual improvement of the EMS.

The EMS continually moves through this cycle, fine-tuning its management of those areas of the organization's operations that harm the environment. This "continual improvement cycle" is a core tenet of the EMS; it allows the system to adapt to the dynamic nature of the organization's operations.

## KEY ELEMENTS OF AN EMS

### 1.1. EMS Scope

Every organization has its own goals that stem from the vision and aspirations of its founders and leaders. These may span the gamut from client service to social service to national defense goals. The possibilities can be virtually limitless. An EMS takes this as a fact, as a pre-existing condition from which the awareness and desire to be environmentally responsible emerge. That desire itself becomes an organizational goal when it is transformed into a commitment. This commitment must be specifically expressed in a written environmental policy when the organization decides to implement an EMS.

### 1.2. Environmental Policy

The Environmental Policy verbalizes the organization's commitment to be environmentally responsible. The content of the environmental policy describes the organizations aspirations, evoking the degree of commitment by top management and serving as a beacon to influence the behavior and actions of all members of the organization to high achievement for environmental protection.

### 1.3. Planning (see EMS Kansas City Standard Operating Procedures for areas below)

EMS planning activities determine the environmental aspects and impacts of the work conducted at the ESC. Environmental management programs (EMPs) are designed to control and reduce, where possible, the impacts associated with the identified aspects.

#### *1.3.1. Environmental Aspects*

The organization's interactions with the environment are its environmental aspects. These interactions are identified by reviewing all the activities, products and services of the organization and assessing the possibility of each of them to have an environmental impact. It is important to recognize that these impacts may be positive or negative and that the organization should set objectives to increase positive impacts and reduce negative impacts. The organization can then develop programs to manage the environmental aspects they believe are significant either to the environment or to the organization. .

#### *1.3.2. Legal and Other Requirements*

An EMS recognizes that certain environmental aspects are significant for an organization because they impinge upon certain legal or other requirements, which can affect the organization's ability to carry out its mission. These may include federal and state requirements, industry standards, or organizational standards. The organizations must establish a procedure to identify these requirements. In most cases it is prudent for all environmental aspects with legal implications to be designated as significant.

#### *1.3.3. Objectives and Targets*

Generally objectives and targets are established to address each of the organization's significant environmental aspects and are integrated at all levels and functions of the entity. Objectives and targets are set by considering, in part, the legal and other requirements, the views of interested parties, as well as, technological, financial and other operational considerations. This ensures that objectives and targets are robust, that they respond to legitimate concerns, that they are realistic for the organization, and that it is possible to develop strong management programs to achieve them.

#### *1.3.4. Environmental Management Programs (EMPs)*

Environmental management programs serve to achieve the organization's objectives and targets, and are therefore linked directly to them. EMPs contain details on the resources (e.g., financial, human, and technological) and timeframes to accomplish the objectives and targets. They also contain information describing the approaches and strategies for achieving objectives and targets, as well as the performance indicators, the operational controls, the roles and responsibilities to accomplish tasks, and the competency of individuals to accomplish those tasks. The EMP ties many elements of the EMS together (e.g., significant aspects, objectives and targets, resources, responsibilities, and capabilities) and provides an integrated view of the disparate requirements in the EMS.

### **1.4. Implementation and Operation** (see EMS Kansas City Standard Operating Procedures for areas below)

#### *1.4.1. Roles, Authorities and Responsibilities*

Roles and responsibilities for activities under the EMS must be clearly defined and as stated above, many of these appear in the EMPs. While an EMS is largely sustained by the voluntary participation and commitment of members of the organization, certain duties are assigned with clear roles and responsibilities and with attendant accountability for performance and results. For example, top management must appoint a management representative to be responsible for leading the creation, implementation, and maintenance of the EMS. Other roles are assigned to members at various levels and functions throughout the organization where significant environmental aspects are present.

#### *1.4.2. Training, Awareness, and Competence*

An EMS requires two types of training: general awareness, and competence training. General awareness training for all employees focuses on the importance of the environmental policy, the role of employees, and the potential consequences of failing to provide environmental care. Competence training is prescribed for members that work in proximity to significant environmental aspects and focuses on the possible significant impacts of those aspects, their specific roles and responsibilities, the objectives and targets for those aspects, and the operational controls in place to avert the actualization of the potential impacts. Competence training is detailed in the EMPs and in the documentation of operational controls. The EMS Coordinator ensures that both types of training are conducted as appropriate to satisfy these requirements.



#### *1.4.3. Communication*

Clearly, effective integrated environmental management demands effective communications to coordinate staff internally and to liaise with external stakeholders. Maintaining employee awareness of EMS initiatives, motivating them, and supplying them with knowledge of their roles and responsibilities all require communication. It is also true that communication is a two-way process; that employees can make recommendations to management and give their views when necessary.

One must remember that views of interested parties should be considered in the EMS. This means that there must be effective two-way communication between external stakeholders and the facility. Interested parties should be able to communicate their views to the facility, and the facility should be able to respond to these parties.

#### *1.4.4. EMS Documentation*

It is important that the organization maintain information that would allow someone with a legitimate interest in the EMS to understand how it is designed and implemented. This information is essential for employees who need to know about an EMS issue, as well as for external parties such as customers, regulators, registrars and other interested parties. In many cases the EMS Manual will fulfill this documentation requirement. However it is likely that some documents will be maintained outside the EMS Manual in which case they must be referenced in the Manual.

#### *1.4.5. Document Control*

Due to the wide variety of documents used in the EMS it is essential that a formal approach be developed to control and organize them. This document control procedure must ensure that the documents being used are the most up-to-date versions. This includes removing obsolete documents from circulation.

#### *1.4.6. Operational Control*

It is important to control those activities, products or services that might cause a deviation from the organization's environmental policy or result in significant impacts. These controls are designed to support the achievement of EMS objectives and targets. An operational control is a specified engineering or administrative measure implemented to reduce the risk that an impact will occur. Operational controls are included as integral components of the EMPs. Because of their volume, they may be physically separated from the EMP but must be referenced in such instances with a pointer in the EMP.

#### *1.4.7. Emergency Preparedness and Response*

The EMS provides a systematic method to manage known and expected elements of the organization's operations. However, despite best efforts there is the possibility of unpredictable accidents and emergencies. Those that are predictable should have been addressed in the EMS through the EMPs and the operational controls. The organization's emergency preparedness and response plan provides for the unexpected. From the perspective of the EMS, it is necessary that measures be included in this plan to address the environmental consequences of such occurrences. It is expected that such measures work to control and mitigate those possible

environmental consequences.

**1.5. Checking and Corrective Action** (see EMS Kansas City Standard Operating Procedures for areas below)

*1.5.1 Monitoring and Measurement*

Monitoring and measurement is fundamental to the EMS, it ensures that management plans; controls, and training are effective. Furthermore, it enables the organization to identify its progress toward achieving objectives and targets, and the reasons for its level of achievement. Without effective monitoring and measurement it is impossible to continually improve which is the basis of the EMS. Organizations are required to periodically monitor performance, operational controls, and general conformance with EMS objectives and targets.

## **U.S. ENVIRONMENTAL PROTECTION AGENCY'S EMS**

In April 2000, former President Clinton signed Executive Order (E.O.) 13148, "Greening the Government through Leadership in Environmental Management". This is supported by the current administration and establishes a 5-year EMS implementation goal for all Federal Facilities. The U.S. Environmental Protection Agency (EPA), as the principle steward for the environment, has taken a leadership position by developing an EMS implementation initiative. This initiative includes the implementation of EMS at EPA facilities across the nation. To learn more about EPA and EMS go to [EPA's Environmental Management System Site](#)

### ***EPA 12 STEP EMS PERFORMANCE CHECKLIST***

- STEP 1: Identifying a primary EMS Contact and backup personnel.**
- STEP 2: Performing an EMS self-assessment.**
- STEP 3: Putting a local EMS policy or commitment letter in place.**
- STEP 4: Identifying significant environmental aspects.**
- STEP 5: Identifying EMS objectives and targets.**
- STEP 6: Establishing the EMS manual.**
- STEP 7: Specifying EMS operational controls.**
- STEP 8: Assigning EMS responsibilities.**
- STEP 9: Identifying EMS procedures.**
- STEP 10: Establishing an internal EMS self-audit program.**
- STEP 11: Establish the management review process.**
- STEP 12: Complete the EPA Self-declaration process (or external ISO 14001 registration).**

## SOME USEFUL EMS REFERENCE DOCUMENTS

This page contains references to various EMS guides and other documentation that might be useful to staff at the Kansas City Regional Office and Science and Technology Center.

<b>Documents</b>
<a href="#">An Implementation Guide for Small and Medium Sized Organizations (EPA, 2001)</a>
<a href="#">Integrated Environmental Management Systems Implementation Guide (EPA, 2002)</a>
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Institute of Quality Assurance. 1995. <i>Quality Systems in the Small Firm: a Guide to the Use of the ISO 9000 Series</i> . March 1995.
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Creating an Action Plan. Michigan Department of Commerce and Natural Resources, Environmental Services Division, November 1994.
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Tibor, T., and Feldman, I. 1996. <i>ISO 14000 A Guide to the New Environmental Management Standards</i> . Irwin Professional Publishing.
United Nations Environment Programme (UNEP). 1995. <i>Environmental Management System Training Resource Kit</i> . Version 1.0, UNEP, the International Chamber of Commerce (ICC), and the International Federation of Consulting Engineers (FIDIC). December 1995.
United States Postal Service. 1995. <i>Environmental Resources Handbook</i> . United States Postal Service.
<b>Internet Sites</b>
<a href="#">Environmental Management Systems Home Page</a>
<a href="#">EPA's Action Plan for Promoting the Use of Environmental Management Systems (EMS)</a>
<a href="#">EPA's EMS Web site</a>
EPA's EMS Web site: <a href="#">EMS Publications</a>
<a href="#">EPA's National Compliance Assistance Clearinghouse</a>
EPA's National Compliance Assistance Clearinghouse: <a href="#">EMS Page</a>
<a href="#">EPA's National Environmental Performance Track</a>

<a href="#">Global Reporting Initiative (GRI)</a>
<a href="#">Iowa Waste Reduction Center: EMS Service Center</a>
<a href="#">Northeast Business Environmental Network (NBEN) (2002)</a>

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*this section should mention the emergency generator O&M/fuel/emissions*

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It is the practice of the Laboratory to purchase

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The boiler and emergency generators are the primary consumers of fuel oil and thus emit air pollutants associated with combustion.

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Low sulfur/20% bio-diesel fuel oil

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the most

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of the boilers.

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The maintenance contractor completes daily, weekly and monthly inspections of the boilers that are recorded in the boiler log and on preventative maintenance sheets.

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reported to the Facility Manager for

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These inspections are recorded in the boiler log and on preventative maintenance sheets.

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*specifically discuss what we would do if the boiler failed the visible emissions test (and what constitutes failing the test)*

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Procure and/or install corrective services or hardware



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Equipment inspections (preventive maintenance)		
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Monitor visible emissions from the boiler and emergency generators		
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Internal/external i		
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reports (boiler		
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Visible emissions from the boiler and emergency generators		
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Clever Brooks		
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Certificate of fuel quality		
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Facility Manager O&M Contractor		

#### FacilitySHEMP Manager

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:		
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; create and keep records relative to operational controls		
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controls are in place and working.		
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Responsibility (to ensure controls are in place; keep controls working; take action when controls fail; create and keep records relative to operational controls):		

Program management  
Equipment inspections and surveys  
Preventive maintenance

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Release to the Environment/Exposure in the Laboratory

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Operational Controls such as technological, operational, procedural (and corresponding written controls, where applicable):

The Manchester Environmental Laboratory (MEL) maintains an electronic chemical inventory system of low/medium use chemicals. This chemical inventory is updated annually. High use/turnover chemicals (methylene chloride, acetone, certain acids, etc.) are not currently managed in a central inventory. Generally, chemicals less than 5 grams in quantity or less than 1% concentration are considered standards and are currently not maintained in this inventory. A more comprehensive inventory system will be developed to include all analytical chemicals, standards and solvents, per the requirements of the National Environmental Laboratory Accreditation Program. Chemicals used by maintenance staff (paints, thinners, etc.) are not included in the inventory.

(some of these OCs will change with the new system)

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g:

he Safety, Health and Environmental Management Program (SHEMP) Manager or  
Waste Disposal Officer .

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(WDO) approves the pPurchases of all chemicals used in analyses are approved by the SHEMP Manager or Waste Disposal Officer (WDO).

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This includes purchases made by the W

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ashington State Department of Ecology

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nvironmental Services Assistance Team

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Approval is usually verbal but can also be represented by initials on a purchase order

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Solid chemicals are added to the chemical inventory system as they are received and an

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An inventory and reduction of solid chemicals is performed annually and the chemical inventory database updated.

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An and inventory reduction solid chemicals performed and updated. These procedures are in the MEL Chemical Hygiene Plan (CHP).

A purchasing agent then places the order and the analysts pick up the chemical upon delivery and move it to their working area.

In some cases, this chemical will be added to the inventory immediately but generally will be recorded during the annual update.

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Annual Lab Safety & Health Inspections identify non-compliance

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in areas within the laboratory.

All relevant policies and procedures are reviewed and the laboratory inspected on a triennial schedule by EPA Headquarters SHEMD.

All new lab waste streams must be documented

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disposed of in compliance with regulations and in a safe and environmentally responsible manner.

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Any unapproved chemicals that “got through the system” may be identified here and corrective actions taken to determine why other OCs may have failed.

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The current chemical inventory is a simple, in-house developed system that allows all MEL EPA/ESAT staff the ability to search the inventory. WDOE does not have direct access to the system because they are on a separate LAN. Paper copies of the inventory, updated annually, are available to staff. To be noted, currently 95-99% of all chemicals purchased by MEL staff are either high use (routine) chemicals or standards and so are not currently recorded in the chemical inventory. Usage metrics for high use chemicals/solvents that are not maintained within the inventory system are obtained from the purchasing records as well as the recycling records. It is the intention of MEL to eventually include all purchased chemicals in an inventory.

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There are limits to the quantity of some chemicals that may be stored on-site per the MEL Chemical Hygiene Plan (CHP). These limits are to prevent non-compliance with Community Right-to-Know regulations.

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Procedures and Documents:  
 Chemical Hygiene Plan (CHP)  
 Procedure for purchasing chemicals (Chemical Hygiene Plan)  
 Chemical inventory system  
 Chemical purchase approval processes  
 Chemical receiving process

Triennial inspections by EPA Headquarters SHEMD  
 Annual lab safety refresher training and monthly discussion of safety issues at USEPA meetings  
 Sample preparation and analysis waste stream fact sheets  
 Team Leader, EMS Coordinator, WDO, and SHEMP Manager oversight  
 Triennial inspections by USEPA SHEMD  
 Annual lab safety refresher training and monthly EPA all-staff safety scenario discussions

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Annual Safety & Health		
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compliant		
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Laboratory		
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All new laboratory waste streams must be documented.

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Review procedures periodically		
Upgrade EPA/ESAT chemical inventory system to allow tracking of all reagents, solvents and standards with a unique identifier (allowing for proper disposal upon expiration)		
Conduct regular chemical inventory database back-ups		
Annual physical re-inventory of facility chemicals		
Health and Safety Committee develops new procedures as necessary		
Assess waste from analyses		
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implements		
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change		
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Appropriate		
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ions		
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as needed		
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Additional training as needed

Team Leader, EMS Coordinator, WDO, and SHEMP Manager implement corrective action changes

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SHEMP Manager approval of non-routine chemical purchases *this doesn't exist in most cases?*

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## 2. Health and Safety Committee reports

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SHEMP Manager

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SHEMP Manager, Health and Safety Committee

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Laboratory Staff

SHEMP Manager

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Chemical Inventory list

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External and internal

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5. Facility chemical inventory reports

6. Minutes from monthly Health and Safety Committee meetings

7.

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4. SHEMP Manager

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## 6. SHEMP Manager

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## 7. SHEMP Manager

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Internal and external inspection/audit reports

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SHEMP Manager

SHEMP Manager, Purchasing Officers

SHEMP Manager, Health and Safety Committee

Lab Staff

SHEMP Manager

SHEMP Manager

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Facility chemical inventory reports

Purchase records and SHEMP Manager approval of chemicals

Health and Safety Committee reports

Reports on chemical use reduction

Chemical Inventory list

External and internal regulatory compliance reports

Facility chemical inventory reports

Minutes from monthly Health and Safety Committee meetings

Internal and external inspection reports

Purchase records of chemicals (USEPA)

Purchase records of chemicals (WDOE)

8 hour annual safety training content and attendance

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Facility chemical inventory reports  
Purchase records and SHEMP Manager approval of chemicals  
Health and Safety Committee reports

Reports on chemical use reduction  
Chemical Inventory list  
External and internal regulatory compliance reports  
Facility chemical inventory reports  
Minutes from monthly Health and Safety Committee meetings  
Internal and external inspection reports

10. Purchase records of chemicals (USEPA)

11. Purchase records of chemicals (WDOE)

12. 8 hour annual safety training content and attendance

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SHEMP Manager  
SHEMP Manager, Purchasing Officers  
SHEMP Manager, Health and Safety Committee  
Lab Staff  
SHEMP Manager  
SHEMP Manager

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*shouldn't some of these activities be reflected in the maintenance plan above?*

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r

r, WDO

WDO, SHEMP Manager, Health and Safety Committee, Laboratory staff, Chemistry Supervisors  
Laboratory sStaff, Team Leaders

WDO, Laboratory staff

SHEMP Manager

Responsibility (to ensure controls are in place; keep controls working; take action when controls fail; create and keep records relative to operational controls): (SWITCH COLUMNS)

Laboratory staff, Purchasing Officerr

*, can they easily do this?*

Lab staff, SHEMP Manager or WDO

Laboratory staff

SHEMP Manager, Health & Safety Committee members

SHEMP Manager

SHEMP Manager, EPA Headquarters SHEMD

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Create a list of chemicals approved by the SHEMP Manager or WDO that were purchase during the past two years - SHEMP Manager		
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MEL has a 10,000 gallon underground heating oil storage tank with a leak detection system. Heating oil vendors follow “safe delivery” procedures to avoid spilling heating oil while refilling the tank. Spill containment supplies are stored adjacent to the fill port in case a spill occurs during the refilling process.		
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underground storage tank		
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turban		
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fuel piping		
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a significant spill occurs during filling, s		
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undertaken by the fuel delivery personnel and the local emergency services or environmental resources are notified.		
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by facility staff and the appropriate regulatory agencies notified. (are these procedures spelled out somewhere? reference procedures)		
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Depending on the specifics of the spill, specific agencies to contact could be the US Coast Guard, USEPA National Response Center, and the WDOE Spill Response Section. Spill clean up equipment is in close proximity to the filling port.		
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in close proximity to		
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Page 76: [105] Deleted	landerso	1/7/2005 12:59:00 PM
2. Evaluate additional controls		
3. Procure and/or install corrective services or hardware		
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Training		
Procure and/or install corrective services or hardware		
Evaluate additional controls		
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(preventive maintenance)		
Monitor visible emissions from the boiler and emergency generators		
Internal/external inspection reports		
Certificate of fuel quality		
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Heating		
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heating		
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Facility Manager		
O&M Contractor		
SHEMP Manager		
Facility Manager		
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controls are in place and working.		
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relevant		
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records

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corrective actions when control fails.

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MEL is a consolidated facility housing offices and extensive chemical and microbiological laboratories for three different organizations. The office activities result in the generation of non-hazardous solid wastes, while the laboratory and facility activities result in the generation of diverse chemical and microbiological wastes of varying quantities and toxicities, as well as additional non-hazardous solid wastes.

MEL is classified as a medium quantity hazardous waste generator by the State of Washington. As such, the facility is allowed to accumulate hazardous waste on-site for no more than 180 days and must generate less than 1 kg of acutely hazardous waste and less than 1000 kg of hazardous waste per month. MEL's SHEMP Manager and Waste Disposal Officer (WDO) develop facility-wide policies and procedures that are in accordance with all Federal, State, and County requirements for all aspects of waste generation, storage and disposal. Most non-hazardous wastes and all non-recyclable, standard solid wastes are removed from the facility by a contract waste hauler under the supervision of the Facility Manager.

MEL has one USEPA RCRA Generator Identification Number (WA8680030931). The facility has two closely located 180-day hazardous waste storage areas. Both of these 180-day hazardous waste storage areas have their access restricted to the WDO, selected organizational Waste Coordinators, the MEL Facility Manager and the EPA Laboratory Director. Hazardous waste removal from MEL typically occurs every 4-5 months by a contract hazardous waste hauler under the supervision of the WDO.

One of MEL's environmental goals is to reduce the volume of hazardous waste generated by facility operations. By achieving the Chemical Resources Environmental Management Program (EMP) targets of reducing the amount of toxic chemicals, the volume of solvents, and the total volume of chemicals used in analytical tests, MEL will achieve reductions in the volume of hazardous waste generated by the facility. Eliminating the use of mercury-containing fluorescent bulbs (Electricity EMP), CFC-containing equipment (Air Emissions EMP), and radioactive source equipment (Radiation EMP) will further achievement of this goal.

MEL also has a goal to reduce the amount of non-hazardous waste the facility generates.

This goal will be achieved by reusing more one-use items, e.g. by cleaning and re-using sample bottles; replacing non-recyclable consumable items with recyclable consumable items, e.g. replacing plastic bottles made from number 6-9 plastics with plastic bottles made from number 1-5 plastics; replacing larger containers with smaller containers, e.g. using 100 mL rather than 1000 mL sample collection bottles (see Waste Generation, Recyclable EMP). MEL will also further achievement of this goal by recycling more of the waste stream that can be readily recycled and finding a recycling merchant to accept materials that can't currently be recycled.

Annual internal inspection by Safety Committee  
 Triennial external inspection by EPA HQ (SHEMD)  
 Annual laboratory 8-hour safety refresher training  
 Restricted access to 180-day hazardous waste accumulation areas

Documents:

Chemical Hygiene Plan  
 Hazardous waste disposal procedures (MEL Waste Disposal Manual)  
 Hazardous waste contract requirements (Statement of Work in hazardous waste contract)  
 Secondary containment required for all hazardous materials (Chemical Hygiene Plan Sec.13)

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that could lead to the release of CFCs.

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(is there an sop/set of instructions that BCS follows?)

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inspections and complete preventative maintenance as required. The inspections include checking the seals, temperature, and for leaks. They also clean the coils and condensers and check for oil around fittings. Inspection procedures are identified on the maintenance card and documented on the maintenance log.

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(are they checking for leaks during PMs?)

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Regulatory compliance of CFC chemicals in HVAC units and refrigerators.

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Eliminate from use equipment requiring ozone-depleting substances.

MEL continues to pursue minimizing the possibility of potential releases from CFC-containing devices and

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all CFC

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is

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such time

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will

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The O&M contractor performs preventative maintenance leak tests as required, such as cleaning the coils and condensers and checking for oil around fittings of CFC-containing equipment.

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(do we have a policy statement that says this or do we just have an OC that any new equipment be CFC free?)

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and completes preventative maintenance as required.

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. The contractor cleans the coils and condensers and checks for oil around fittings. Inspection procedures are identified on the maintenance card and documented on the maintenance log.

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Preventive maintenance records (CFC-containing devices)

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*specifically discuss what we would do if a CFC leak was detected*

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any

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leaks

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Procure and/or install corrective services or hardware

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Evaluate additional controls

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(purchase records for refrigerators/etc)

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Operational Controls such as technological, operational, procedural (and corresponding written controls, where applicable):

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WDOE purchases all the printer and copier paper in use at MEL. WDOE has a procurement specification/policy that requiresThe paper currently being purchased hasve 100% post-consumer recycled content, and isbe manufactured with a chlorine-free process. (who is verifying that this is being done?)

(This OC needs to reference a sop/policy/directive that may not currently exist).

A large percentage of MEL's paper usage is for analytical data reporting. Two of the largest usage areas are organics raw or intermediate data reporting and lab-wide final data reports. MEL has a (policy/directive) to createreplaces paper print-outs with electronic data reports wherever possible. The Laboratory Director signs off on all final data reports.

IT Staff will make sure that all desktop PC Systems are by default set to duplex and that all printers are also set to duplex by default. A checklist will be created to ensure this.

To minimize paper use, lab staff are actively encouraged via emails, posted signs and meetings to to reducee paper consumption in all aspects of their daily activities such as by using electronic files rather than print-outs (we really have no way to ensure this)., using double-sided copies or miniaturizing printouts, and printers and copiers are maintained in good working order to reduce wasted copies.

**Maintenance plan(s) for the operational controls:**

Review of Recycling Coordinator's waste stream inspection results and communications by the Recycling Coordinator, EMS Coordinator and Lab Directors

2. Review of report on the amount of paper used for organics data packages and lab-wide final analytical reports by EMS Coordinator, Recycling Coordinator and Lab Directors1. The IT staff use an annual checklist to ensure that all PCs and printers are defaulting to duplex printing. Printers and copiers are maintained in good working order to reduce wasted copies.

2. The Recycling Coordinator periodically checks to confirm that printer and copier paper meet WDOE specifications.

3. The Recycling Coordinator , EMS Coordinator and MEL managers will annually review of the Recycling Coordinator's waste stream inspection results and report on the amount of paper used per FTE and communicate to staff regarding the Laboratory's progress in reducing paper consumptionuse.

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Review of Recycling Coordinator's waste stream inspection results and communications by the Recycling Coordinator, EMS Coordinator and Lab Directors

2. Review of report on the amount of paper used for organics data packages and

lab-wide final analytical reports by EMS Coordinator, Recycling Coordinator and Lab Directors

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, EMS Coordinator and MEL managers

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of the Recycling Coordinator's waste stream inspection results

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use

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2. ???

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and Record Location

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ed Materials

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Managers, (location?).

Laboratory Director, Network G: Drive.Drive.

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Final data reports

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, EMS Records Rm. 55.

Office Managers, (

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double sided copies.

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s).

Office Managers

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## Waste stream inspection results

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l; create and keep records relative to operational controls

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### 1. Office Managers

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relevant records.

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Maintains Relevant records. Follows procedures for creating final reports.

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Ensures controls are in place and working. Investigates and initiates corrective action.

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Ensures controls are in place and working. Investigates and initiates corrective action.  
Maintains Relevant records.

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Follows applicable operational controls and procedures for double sided printing.

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### 8. ESAT Leader

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1998

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2004

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8. Document the number of boxes of printer paper purchased for each year from 1998 to 2004, document the number of FTE using the

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MEL's facilities each year from 1998 to 2004.

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1998

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2004

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Non-hazardous\*

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\*Though rechargeable and mercury batteries will be included in this Operational Control

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(non-mercury containing, non-rechargeable)

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and shredded paper

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It is the policy of the

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aboratory

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to:

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(within reason)

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has been located		
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,		
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bottles		
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bottles		
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5		
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the		
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are delivered		
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RBC in mailing envelopes that the company provides		
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returned to		
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by lab volunteers		
Page 86: [179] Deleted	SBAILEY	1/5/2005 9:06:00 AM
C		
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are donated		
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while		
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by lab volunteers to various recipients for reuse		
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, toner cartridges		
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Page 86: [182] Deleted	SBAILEY	1/5/2005 9:58:00 AM
for recycling. Marine and auto batteries are returned to local stores by lab volunteers for recycling.		
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sold to a local recycler and the money is deposited in the Lab's Recycling Fund.		
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, Inc.

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...

When making purchasing decisions, Make a good-faith effort to ggive preference to items low in toxicity and/or composed ofwith the maximum post-consumer recycled content and less hazardous content when making purchasing decisions. This preference will be affordedoccur where the work product will not be negatively affected.

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monitors

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operation of the

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in such ways as

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the

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(is this really being done? Really?)

May need to have a separate specific OC line here with regard to “universal wastes” (batteries, fluorescent bulbs).

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(these events need to be documented)		
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Occasional (Quarterly?) “Dumpster-dives” and checking

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of the dumpster and individual trash receptacles to identify		
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who produce good ideas for the EMS		
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or		
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e during		
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carpool day		
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Staff redeem		
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r		
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r		
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for small items during special EMS events		
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to ensure compliance. (these events need to be documented)		
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(“inspection reports” and “audit findingsMEL provides workspace for three different organizations and two maintenance crews. An average of 70 full-time employees create a significant amount of solid waste. We believe it is our environmental responsibility to prevent as much of this waste stream as possible from entering the landfill. “are mentioned in the maintenance section. What are these? They should be spelled out here as an OC)

The Recycling Coordinator manages the facility’s recycling program. Currently, the following is recycled or sent out for re-use: glass containers, plastics (#1-5), tin, steel, aluminum, scrap/mixed metal, plastic bags, DVDs, CDs, diskettes, toner cartridges, ink jet cartridges, audio and video tapes, mercury-containing fluorescent bulbs, household batteries, rechargeable batteries, mercury batteries, marine/auto batteries, cell phones, Tyvek envelopes, pallets, cardboard, packing peanuts, shredded paper, and mixed paper.

(Mixed paper is addressed separately in the “Paper Consumption” EMP.)

MEL’s goal is to maximize the percentage of solid waste recycled while at the same time minimizing the total volume of all solid waste generated (recyclable, non-recyclable, hazardous). Where possible we do this by reusing more single-use items, e.g. by cleaning and re-using sample bottles; replacing non-recyclable consumable items with recyclable consumable items, e.g. replacing bottles made from #5-7 plastics with bottles made from #1-5 plastics; replacing larger containers with smaller containers, e.g. using 100 mL rather than 1000 mL sample collection bottles. We also intend to further this goal by recycling more of our recyclable waste stream and finding recycling vendors to accept materials we can’t currently recycle.

Procedures:

Annual (at minimum) Laboratory Recycling Program training

New laboratory employee training

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Weekly inspections of recyclable waste accumulation areas		
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and audit findings by MEL personnel		
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#### 5. New Laboratory employee training

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(how relevant are some of these records in regard to OCs?)		
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Page 87: [208] Change	Tony Morris	12/15/2004 4:53:00 PM
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Waste Management Inc. (WM) recycling invoices		
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Results of routine inspections of in-house and WM		
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recycling receptacles for use level		
Monthly		
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recycled material measurement records		
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Recycling Coordinator  
Recycling Coordinator  
Recycling Coordinator

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Recycled material measurements

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for items not delivered or mailed to a recycler on a monthly basis.

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Weekly dumpster garbage volume measurement records

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l; create and keep records relative to operational controls

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New employee recycling training.

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Inspect the contents of garbage receptacles (minimum twice/year)

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and communicate the results to staff. Look for

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recyclable material in the dumpster periodically. Recycling Program oversight.

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New Employee Recycling Training.

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Regulatory compliance with disposal regulations for mercury-containing and rechargeable

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Responsibility (to ensure controls are in place; keep controls working; take action when controls fail; create and keep records relative to operational controls):  
Regulatory compliance with disposal regulations for mercury-containing bulbs and batteries - Recycling Coordinator,

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Laboratory s Staff volunteers and Recycling Coordinator

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Locate, label, and monitor on-site collection bins for recyclable materials- Recycling Coordinator

Email staff and provide staff meetings with information about the environmental impacts of waste generation - Recycling Coordinator

Provide annual recycling training and monitor attendance - Recycling Coordinator

Inspect the contents of garbage receptacles quarterly and communicate the results to staff - Recycling Coordinator

Measure the amount of recyclable material in the dumpster periodically - Recycling Coordinator

Recycling Program oversight - Recycling Coordinator

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New Employee Recycling Training - Recycling Coordinator

Removal from bins of recycled materials not accepted by WM contract - Recycling Coordinator

Recycling Rewards Program oversight - Recycling Coordinator, volunteer Lab staff

When making purchasing decisions, give preference to items with maximum post-consumer recycled content and less hazardous content where the work product will not be negatively affected - Lab staff, Purchasing Officers

Investigate ideas to encourage staff to reduce the amount of waste they put in their office trash cans - Recycling Coordinator

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and

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and

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laboratory

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MEL is just beginning the process of systematically reducing potable water consumption and intends to conserve potable water as much as possible in order to assist the Agency in meeting the goals of Executive Order 13123.

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(What specific preventive maintenance is done to relevant equipment to prevent problems?)

Preventative maintenance on autoclaves and dishwashers.

(What specifically are the concerns with regards to the cooling towers, HVAC and DI systems?)

Compare historical water usage against current usage to identify anomalies.

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It is the policy of the laboratory to water

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l

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has occurred;

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of

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Upon

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ment

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will be

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do minimal watering of the lawns and landscaping.

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Using permanently installed water meters on water lines to specific equipment, the Facility M

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anager measures water use of the larger facility equipment to aid in the assessment of whether equipment should be cleaned, repaired or replaced.

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(can we be more specific?)(do we have guidelines for the contractor?)

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The O&M contractor inspects and fixes equipment leaks

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in a timely fashion to prevent wasting water.

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? (how do we quantify/ensure this?)

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It is the spoken policy of

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t

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s the

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Staff are trained and sent periodic reminders to minimize the use of water in the programming of dishwashers.

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Should we commit to investigating the approach Region 3 used to save DI water use?

(It seems to me that OCs are not necessary when we decide NOT do do something like using something less. We need to identify the reasons why we WERE using something more and focus our OCs around that. For example I believe the dishwasher programming was the reason we were/are using too much water. Therefore we need to put controls in place to make sure that any new programming is not changed back.)

(I don't think changing a policy that dictates different rinse times needs an OC other then perhaps that the procedure/policy is followed properly)

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We will conserve water used for small point source functions by fixing leaking faucets, leaking toilets, reducing eyewash rinse times, reducing dishwasher and autoclave run times and frequency of use, and minimizing landscape watering.

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Documents:  
SOPs for laboratory equipment (autoclaves, dishwashers, DI water system)

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Staff are sent periodic reminders to minimize the use of water by analytical equipment.

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*How can we prevent dishwashers from being reprogrammed?*

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Compare historical water usage against current usage to identify anomalies.

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The O&M contractor repairs equipment leaks in a timely fashion to prevent wasting water.

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Water usage calculations for equipment

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Monthly preventive maintenance logs

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Facility Manager

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Facility Manager

Energy Coordinato

O&M contractor

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l; create and keep records relative to operational controls):

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Responsibility (to ensure controls are in place; keep controls working; take action when controls fail; create and keep records relative to operational controls):

Determine FY2000 potable water consumption.

Monitor water usage (bimonthly utility bills)

Take periodic water use measurements and compare to historical usage

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5. Dishwasher Operator Post signs reminding staff to conserve water.

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6. Chemistry Supervisor

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Investigate automatic shut-offs for bathroom sink faucet.